Changes for the Better

MITSUBISHI ELECTRIC

SPLIT-TYPE, HEAT PUMP AIR CONDITIONERS

March 2014
No. OCH480
REVISED EDITION-D

HFC utilized R410A

TECHNICAL & SERVICE MANUAL

<Outdoor unit>
[Model Name]
MXZ-8B140VA

[Service Ref.]
MXZ-8B140VA
MXZ-8B160VA
MXZ-8B140YA
MXZ-8B160YA

MXZ-8B160VA

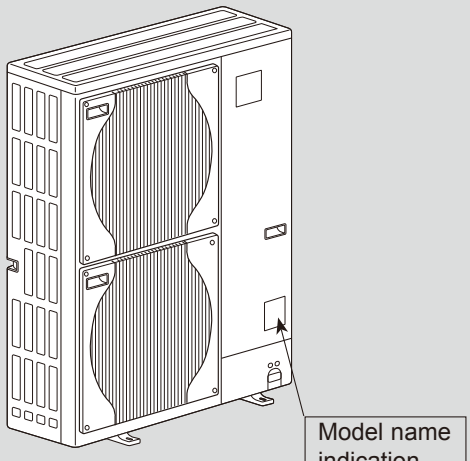
MXZ-8B140YA

MXZ-8B160YA

Revision:
- Added connectable indoor unit MFZ-KJ25VE, MFZ-KJ35VE, and MFZ-KJ50VE in REVISED EDITION-D.
- Some descriptions have been modified.

- Please void OCH480 REVISED EDITION-C.

NOTE:
- This service manual describes technical data of outdoor unit. As for indoor units and branch box (OCH508), refer to its service manual.
- RoHS compliant products have <G> mark on the spec name plate.



OUTDOOR UNIT

CONTENTS

1. SAFETY PRECAUTION ····· 2
2. OVERVIEW OF UNITS ····· 5
3. SPECIFICATIONS ····· 12
4. DATA ····· 13
5. OUTLINES AND DIMENSIONS ····· 17
6. WIRING DIAGRAM ····· 18
7. NECESSARY CONDITIONS FOR SYSTEM CONSTRUCTION ··· 20
8. TROUBLESHOOTING ····· 22
9. ELECTRICAL WIRING ····· 56
10. WIRING SPECIFICATIONS ····· 58
11. SYSTEM CONTROL ····· 59
12. REFRIGERANT PIPING TASK ····· 61
13. DISASSEMBLY PROCEDURE ····· 64

INDOOR UNITS COMBINATION SHEETS

PARTS CATALOG (OCB480)

1 SAFETY PRECAUTION

1-1. ALWAYS OBSERVE FOR SAFETY

Before obtaining access to terminal, all supply circuit must be disconnected.

1-2. CAUTIONS RELATED TO NEW REFRIGERANT

Cautions for units utilizing refrigerant R410A

Use new refrigerant pipes.

Make sure that the inside and outside of refrigerant piping is clean and it has no contaminants such as sulfur, oxides, dirt, shaving particles, etc, which are hazard to refrigerant cycle.
In addition, use pipes with specified thickness.

Contamination inside refrigerant piping can cause deterioration of refrigerant oil etc.

Store the piping indoors, and both ends of the piping sealed until just before brazing.
(Leave elbow joints, etc. in their packaging.)

If dirt, dust or moisture enters into refrigerant cycle, that can cause deterioration of refrigerant oil or malfunction of compressor.

The refrigerant oil applied to flare and flange connections must be ester oil, ether oil or alkylbenzene oil in a smalll amount.

If large amount of mineral oil enters, that can cause deterioration of refrigerant oil etc.

Charge refrigerant from liquid phase of gas cylinder.

If the refrigerant is charged from gas phase, composition change may occur in refrigerant and the efficiency will be lowered.

Do not use refrigerant other than R410A.

If other refrigerant (R22 etc.) is used, chlorine in refrigerant can cause deterioration of refrigerant oil etc.

Use a vacuum pump with a reverse flow check valve.

Vacuum pump oil may flow back into refrigerant cycle and that can cause deterioration of refrigerant oil etc.

Use the following tools specifically designed for use with R410A refrigerant.

The following tools are necessary to use R410A refrigerant.

Tools for R410A	
Gauge manifold	Flare tool
Charge hose	Size adjustment gauge
Gas leak detector	Vacuum pump adaptor
Torque wrench	Electronic refrigerant charging scale

Handle tools with care.

If dirt, dust or moisture enters into refrigerant cycle, that can cause deterioration of refrigerant oil or malfunction of compressor.

Do not use a charging cylinder.

If a charging cylinder is used, the composition of refrigerant will change and the efficiency will be lowered.

Use the specified refrigerant only.

Never use any refrigerant other than that specified.
Doing so may cause a burst, an explosion, or fire when the unit is being used, serviced, or disposed of.
Correct refrigerant is specified in the manuals and on the spec labels provided with our products.
We will not be held responsible for mechanical failure, system malfunction, unit breakdown or accidents caused by failure to follow the instructions.

Ventilate the room if refrigerant leaks during operation. If refrigerant comes into contact with a flame, poisonous gases will be released.

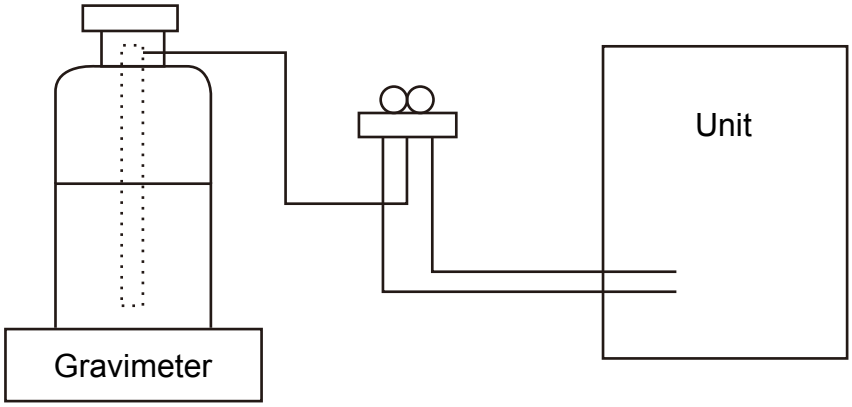
[1] Cautions for service

(1) Perform service after recovering the refrigerant left in unit completely.
(2) Do not release refrigerant in the air.
(3) After completing service, charge the cycle with specified amount of refrigerant.
(4) When performing service, install a filter drier simultaneously.
Be sure to use a filter drier for new refrigerant.

[2] Additional refrigerant charge

When charging directly from cylinder

· Check that cylinder for R410A on the market is syphon type.
· Charging should be performed with the cylinder of syphon stood vertically. (Refrigerant is charged from liquid phase.)



[3] Service tools

(1) Use the below service tools as exclusive tools for R410A refrigerant.

No.	Tool name	Specifications
①	Gauge manifold	· Only for R410A
		· Use the existing fitting specifications. (UNF1/2)
		· Use high-tension side pressure of 5.3MPa·G or over.
②	Charge hose	· Only for R410A
		· Use pressure performance of 5.09MPa·G or over.
③	Electronic scale	——
④	Gas leak detector	· Use the detector for R134a, R407C or R410A.
⑤	Adaptor for reverse flow check	· Attach on vacuum pump.
⑥	Refrigerant charge base	——
⑦	Refrigerant cylinder	· Only for R410A · Top of cylinder (Pink) · Cylinder with syphon
⑧	Refrigerant recovery equipment	——

(2) Cautions for refrigerant piping work

New refrigerant R410A is adopted for replacement inverter series. Although the refrigerant piping work for R410A is same as for R22, exclusive tools are necessary so as not to mix with different kind of refrigerant. Furthermore as the working pressure of R410A is 1.6 times higher than that of R22, their sizes of flared sections and flare nuts are different.

① Thickness of pipes

Because the working pressure of R410A is higher compared to R22, be sure to use refrigerant piping with thickness shown below. (Never use pipes of 0.7 mm or below.)

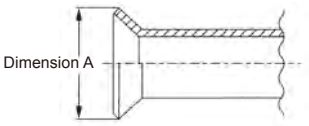
Diagram below: Piping diameter and thickness

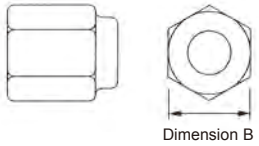
Nominal dimensions(inch)	Outside diameter (mm)	Thickness (mm)	
		R410A	R22
1/4	6.35	0.8	0.8
3/8	9.52	0.8	0.8
1/2	12.70	0.8	0.8
5/8	15.88	1.0	1.0
3/4	19.05	—	1.0

② Dimensions of flare cutting and flare nut

The component molecules in HFC refrigerant are smaller compared to conventional refrigerants. In addition to that, R410A is a refrigerant, which has higher risk of leakage because of its working pressure higher than that of other refrigerants. Therefore, to enhance airtightness and intensity, flare cutting dimension of copper pipe for R410A has been specified separately from the dimensions for other refrigerants as shown below. The dimension B of flare nut for R410A also has partly been changed to increase intensity as shown below. Set copper pipe correctly referring to copper pipe flaring dimensions for R410A below. For 1/2" and 5/8", the dimension B changes.

Use torque wrench corresponding to each dimension.





Flare cutting dimensions

Nominal dimensions (inch)	Outside diameter (mm)	Dimension A ($^{+0}_{-0.4}$) (mm)	
		R410A	R22
1/4	6.35	9.1	9.0
3/8	9.52	13.2	13.0
1/2	12.70	16.6	16.2
5/8	15.88	19.7	19.4
3/4	19.05	—	23.3

Flare nut dimensions

Nominal dimensions (inch)	Outside diameter (mm)	Dimension B (mm)	
		R410A	R22
1/4	6.35	17.0	17.0
3/8	9.52	22.0	22.0
1/2	12.70	26.0	24.0
5/8	15.88	29.0	27.0
3/4	19.05	—	36.0

③ Tools for R410A (The following table shows whether conventional tools can be used or not.)

Tools and materials	Use	R410A tools	Can R22 tools be used?	Can R407C tools be used?
Gauge manifold	Air purge, refrigerant charge and operation check	Tool exclusive for R410A	×	×
Charge hose		Tool exclusive for R410A	×	×
Gas leak detector	Gas leak check	Tool for HFC refrigerant	×	○
Refrigerant recovery equipment	Refrigerant recovery	Tool exclusive for R410A	×	×
Refrigerant cylinder	Refrigerant charge	Tool exclusive for R410A	×	×
Applied oil	Apply to flared section	Ester oil and alkylbenzene oil (minimum amount)	×	Ester oil: ○ Alkylbenzene oil: minimum amount
Safety charger	Prevent compressor malfunction when charging refrigerant by spraying liquid refrigerant	Tool exclusive for R410A	×	×
Charge valve	Prevent gas from blowing out when detaching charge hose	Tool exclusive for R410A	×	×
Vacuum pump	Vacuum drying and air purge	Tools for other refrigerants can be used if equipped with adapter for reverse flow check	△ (Usable if equipped with adapter for reverse flow)	△ (Usable if equipped with adapter for reverse flow)
Flare tool	Flaring work of piping	Tools for other refrigerants can be used by adjusting flaring dimension	△ (Usable by adjusting flaring dimension)	△ (Usable by adjusting flaring dimension)
Bender	Bend the pipes	Tools for other refrigerants can be used	○	○
Pipe cutter	Cut the pipes	Tools for other refrigerants can be used	○	○
Welder and nitrogen gas cylinder	Weld the pipes	Tools for other refrigerants can be used	○	○
Refrigerant charging scale	Refrigerant charge	Tools for other refrigerants can be used	○	○
Vacuum gauge or thermistor vacuum gauge and vacuum valve	Check the degree of vacuum. (Vacuum valve prevents back flow of oil and refrigerant to thermistor vacuum gauge)	Tools for other refrigerants can be used	○	○
Charging cylinder	Refrigerant charge	Tool exclusive for R410A	×	—

× : Prepare a new tool. (Use the new tool as the tool exclusive for R410A.)
△ : Tools for other refrigerants can be used under certain conditions.
○ : Tools for other refrigerants can be used.

2 OVERVIEW OF UNITS

2-1. CONSTRUCTION OF SYSTEM

Outdoor unit			MXZ-8B140VA/160VA	MXZ-8B140YA/160YA
			5HP	6HP
	Rated capacity (kW)	Cooling	14.0	15.5
		Heating	16.0	18.0
	Refrigerant		R410A	
Indoor unit that can be connected	**Capacity**		Type 15 ~ Type 100 **CAUTION** : The indoor unit which rated capability exceeds 10.0kW (100 type) can NOT be connected.	
	Number of units		2 ~ 8 units	
	Total system wide capacity		21 ~ 132 % of outdoor unit capacity (3.0 kW ~ 18.5 kW)	19 ~ 130 % of outdoor unit capacity (3.0 kW ~ 20.2 kW)
Branch box that can be connected	Number of units		1 ~ 2 units	

Connectable indoor unit lineup (Heat pump inverter type)

Model type		Model name	Capacity class (kW)											
			1.5	1.8	2.0	2.2	2.5	3.5	4.2	5.0	6.0	7.1	8.0	10.0*
Wall mounted	Deluxe	MSZ-FA25/35VA					●	●						
		MSZ-FB25/35/50VA(H)					●	●		●				
		MSZ-FD25/35/50VA					●	●		●				
		MSZ-FH25/35/50VE					●	●		●				
	Standard	MSZ-GA22/25/35/50/60/71/80VA				●	●	●		●	●	●	●	
		MSZ-GB50VA								●				
		MSZ-GC22/25/35VA				●	●	●						
		MSZ-GC22/25/35/50/60/71NA				●	●	●		●	●	●		
		MSZ-GE22/25/35/42/50/60/71/80VA				●	●	●	●	●	●	●	●	
		MSZ-SF25/35/42/50VE					●	●	●	●				
		MSZ-GE22/25/35/42/50/60/71NA				●	●	●	●	●	●	●		
		MSZ-GF60/71VE									●	●		
		MSZ-EF18/22/25/35/42/50VE		●		●	●	●	●	●				
	Compact	MSZ-SF15/20VA	●		●									
Ceiling concealed	Low static pressure	SEZ-KA/KC25/35/50/60/71VA					●	●		●	●	●		
		SEZ-KD25/35/50/60/71VA(L)					●	●		●	●	●		
	Middle static pressure	PEAD-RP50/60/71/100JA(L)Q.UK								●	●	●		●
	High static pressure	PEA-RP71EA/RP100EA2										●		●
		MCFZ-GA35/50/60VA						●		●	●			
4-way ceiling cassette	2 by 2 type	SLZ-KA25/35/50VA(L)					●	●		●				●
	Standard	PLA-RP35/50/60/71AA(.UK)/BA(.UK)						●		●	●	●		
		PLA-RP71BA2.UK										●		
		PLA-RP100BA/BA3												●
Floor standing		MFZ-KA25/35/50VA					●	●		●				
		MFZ-KJ25/35/50VE					●	●		●				
1-way ceiling cassette		MLZ-KA25/35/50VA					●	●		●				

<NOTE> The lineup of a connectable indoor unit depends on a district/areas/country.
* When connectiing the indoor unit with the number 100, use the PAC-AK52YP-E Y-shape connection pipe (Optional part).

Branch box	PAC-AK53BC	PAC-AK32BC
Number of branches (Indoor unit that can be connected)	5 branches (MAX. 5 units)	3 branches (MAX. 3 units)

Max. 2 branch boxes can be connected to 1 outdoor unit.

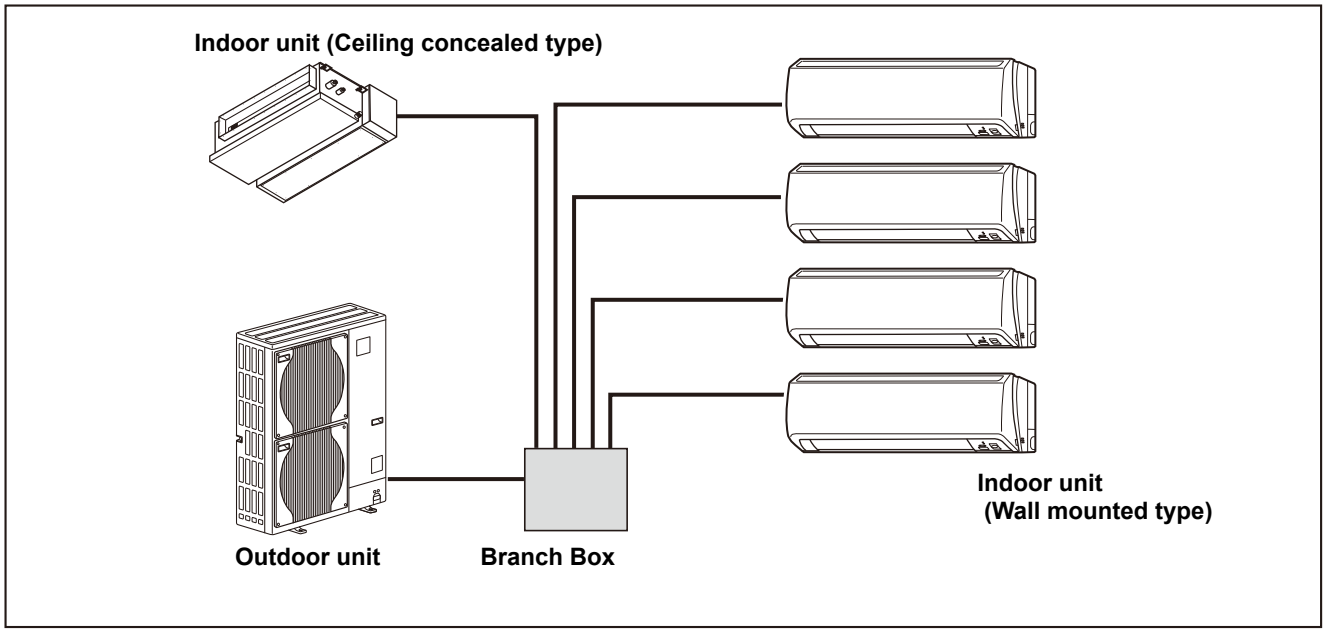
2- branch pipe (joint) : Optional parts		
In case of using 1- branch box	No need	
In case of using 2- branch boxes	Model name	Connection method
	MSDD-50AR-E	flare
	MSDD-50BR-E	brazing
	According to the connection method, you can choose the favorite one.	

Option	Optional accessories of indoor units and outdoor units are available.

2-2. SYSTEM OUTLINE

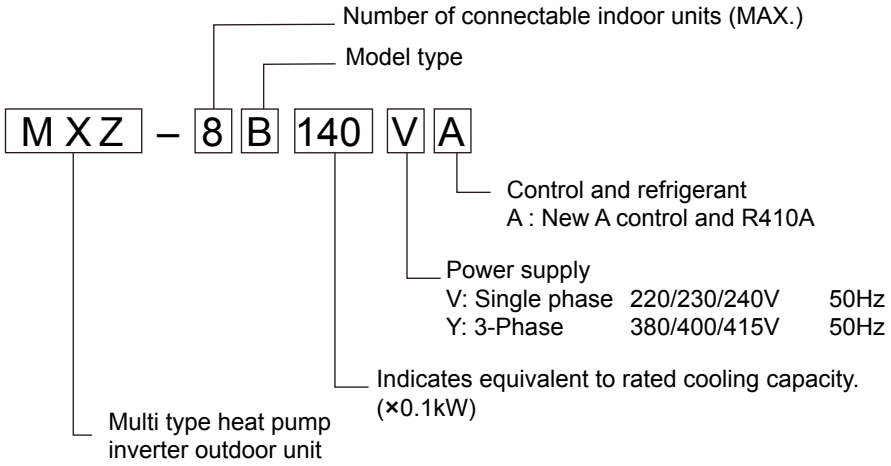
The additional connection of the Branch Box together with employment of the compact trunk-looking outdoor unit can successfully realizes a long distance piping for big houses. Equipped with a microprocessor, the Branch Box can translate the transmission signal of indoor units to achieve the optimum control.

2-2-1. System example

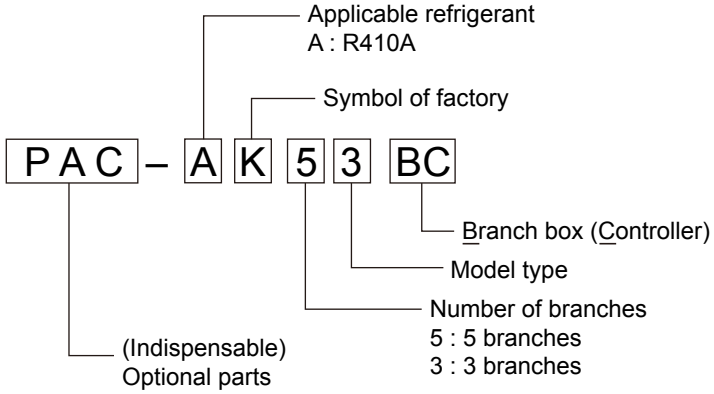


2-2-2. Method for identifying

■ **Outdoor unit**

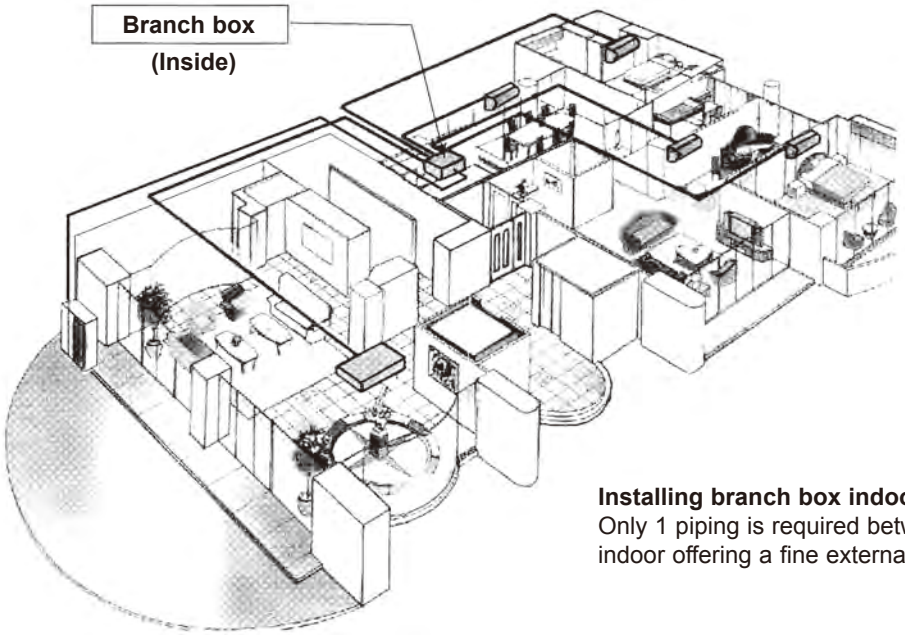


■ **Branch box**



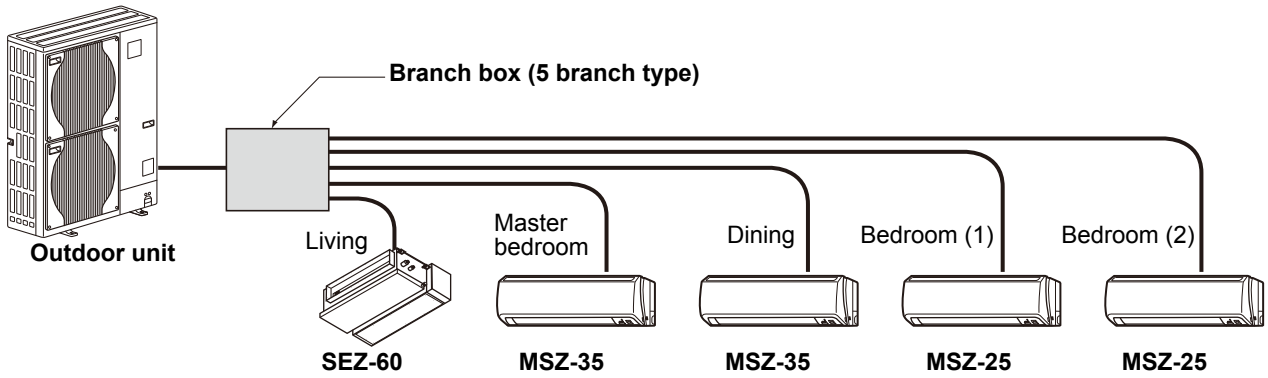
2-3. TYPICAL COMBINATION EXAMPLE

Branch box is located INSIDE of condominium



Installing branch box indoors
Only 1 piping is required between the outdoor and indoor offering a fine external view.

■ **System example of 5 indoor units**



■ **Verification**

The rated capacity should be determined by observing the table below. The unit's quantities are limited in 2 to 8 units.
For the next step, make sure that the selected total rated capacity is in a range as shown below.
The total indoor unit capacity should be within the outdoor units.
Combination of excessive indoor units and an outdoor unit may reduce the capacity of each indoor unit.
The rated indoor capacity is as the table below.

- **MXZ-8B140 3.0 ~ 18.5 kW**
- **MXZ-8B160 3.0 ~ 20.2 kW**

Example: MXZ-8B140

SEZ-60	= 6.0	
	+	
MSZ-35	= 3.5	
	+	Total rated capacity
MSZ-35	= 3.5	
	+	18.0 ≦ 18.5kW
MSZ-25	= 2.5	
	+	
MSZ-25	= 2.5	

Indoor unit type (capacity class)	15	18	20	22	25	35	42	50	60	71	80	100
Rated capacity (cooling) (kW)	1.5	1.8	2.0	2.2	2.5	3.5	4.2	5.0	6.0	7.1	8.0	10.0

2-4. INSTALLATION

2-4-1. Outdoor unit installation location

For best performance, select proper position.

- Avoid places where combustible gas may be generated or leak.
- Avoid direct sunlight or other sources of heat.
- Install sunshade to protect the outdoor unit if direct sunlight hits the unit.
- Install the outdoor unit with enough distance between neighbours as operation noise may disturb the neighbours.
- Avoid the position that the unit is covered by snow or snow blows directly against the air outlet. The snow block or blow will reduce the airflow of the outdoor unit.
  In the areas of heavy snow, special countermeasures must be taken at installation to protect the outdoor unit from malfunction caused by snow.
- Select a location permitting easy wiring and pipe access to the power source and indoor unit.
- Drain water must be drained freely during operation. Check for draining.

2-4-2. Ventilation and service space

(1) Windy location installation

When installing the outdoor unit on a rooftop or other location unprotected from the wind, situate the air outlet of the unit so that it is not directly exposed to strong winds. Strong wind entering the air outlet may impede the normal airflow and a malfunction may result.

The following shows 3 examples of precautions against strong winds.

- Face the air outlet towards the nearest available wall about 50 cm away from the wall. (Fig. 2-1)
- Install an optional air guide if the unit is installed in a location where strong winds from a typhoon, etc. may directly enter the air outlet. (Fig. 2-2)
  Ⓐ Air guide
- Position the unit so that the air outlet blows perpendicularly to the seasonal wind direction, if possible. (Fig. 2-3)
  Ⓑ Wind direction

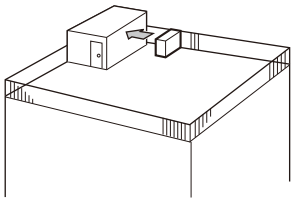


Fig. 2-1

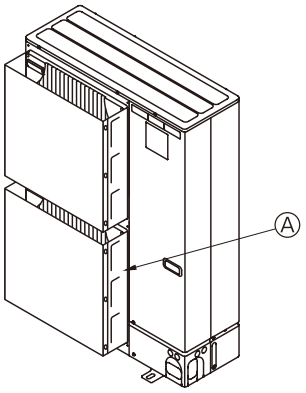


Fig. 2-2

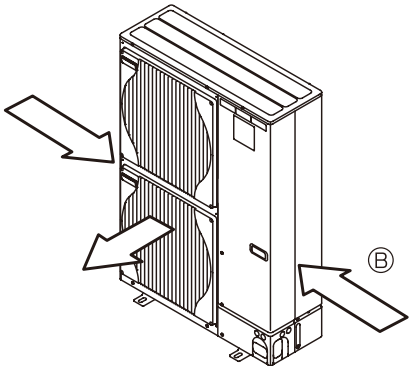


Fig. 2-3

(2) When installing a single outdoor unit

Minimum dimensions are as follows, except for Max., meaning Maximum dimensions, indicated.
Refer to the figures for each case.

- Obstacles at rear only (Fig. 2-4)
- Obstacles at rear and above only (Fig. 2-5)
  · Do not install the optional air outlet guides for upward airflow.
- Obstacles at rear and sides only (Fig. 2-6)
- Obstacles at front only (Fig. 2-7)
  * When using an optional air outlet guide, the clearance is 500 mm or more.
- Obstacles at front and rear only (Fig. 2-8)
  * When using an optional air outlet guide, the clearance is 500 mm or more.
- Obstacles at rear, sides, and above only (Fig. 2-9)
  · Do not install the optional air outlet guides for upward airflow.

unit : mm

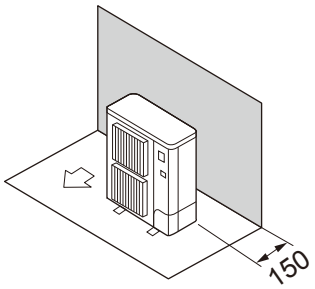


Fig. 2-4

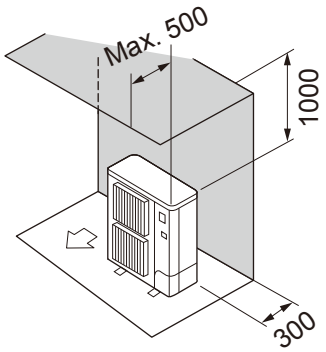


Fig. 2-5

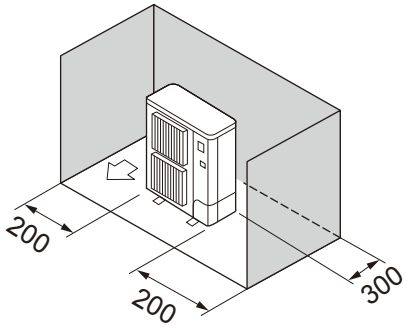


Fig. 2-6

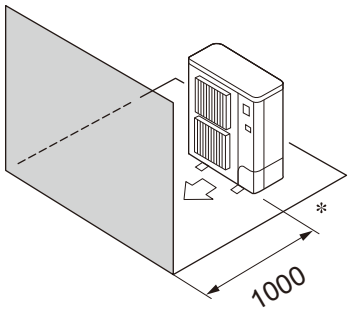


Fig. 2-7

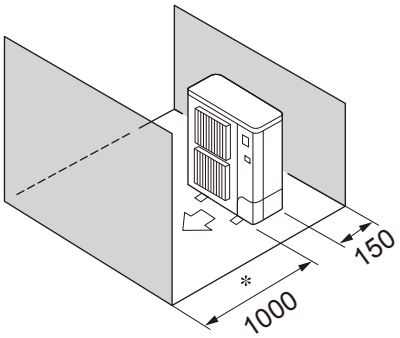


Fig. 2-8

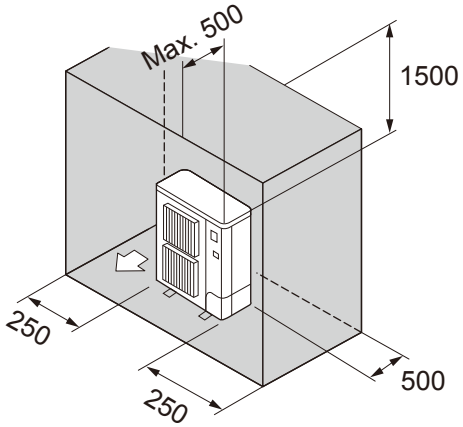


Fig. 2-9

(3) When installing multiple outdoor units

Leave 10 mm space or more between the units.

- Obstacles at rear only (Fig. 2-10)
- Obstacles at rear and above only (Fig. 2-11)
  - No more than 3 units must be installed side by side. In addition, leave space as shown.
  - Do not install the optional air outlet guides for upward airflow.
- Obstacles at front only (Fig. 2-12)
  * When using an optional air outlet guide, the clearance is 1000 mm or more.
- Obstacles at front and rear only (Fig. 2-13)
  * When using an optional air outlet guide, the clearance is 500 mm or more.
- Single parallel unit arrangement (Fig. 2-14)
  * When using an optional air outlet guide installed for upward airflow, the clearance is 1000 mm or more.
- Multiple parallel unit arrangement (Fig. 2-15)
  * When using an optional air outlet guide installed for upward airflow, the clearance is 1500 mm or more.
- Stacked unit arrangement (Fig. 2-16)
  - The units can be stacked up to 2 units high.
  - No more than 2 stacked units must be installed side by side. In addition, leave space as shown.

unit : mm

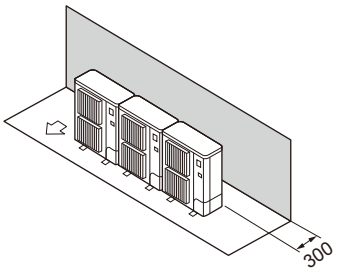


Fig. 2-10

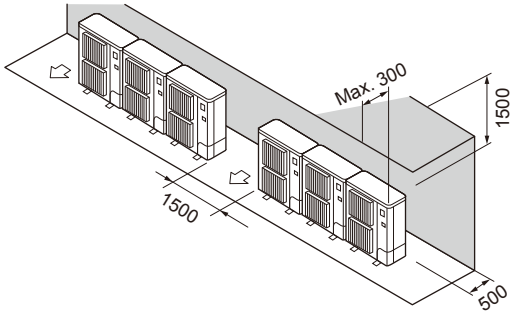


Fig. 2-11

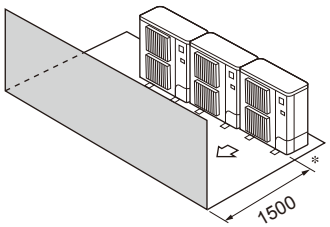


Fig. 2-12

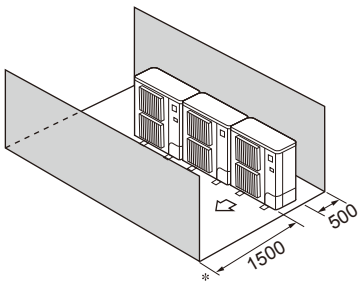


Fig. 2-13

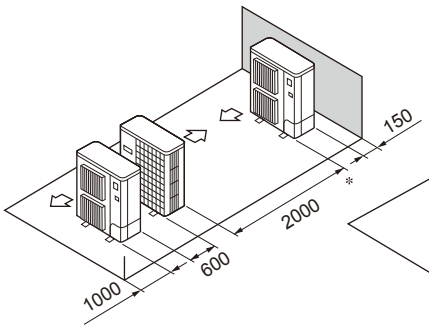


Fig. 2-14

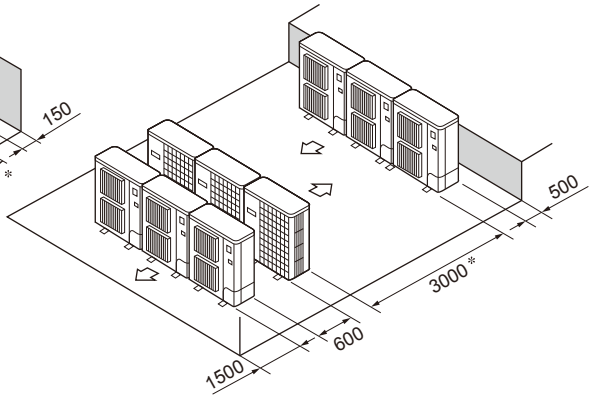


Fig. 2-15

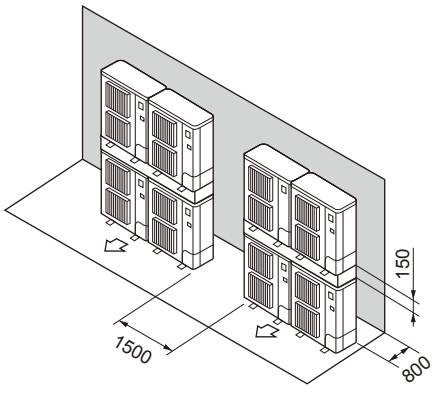


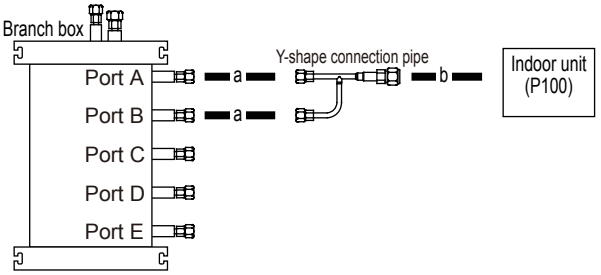
Fig. 2-16

2-5. SIMPLIFIED PIPING SYSTEM

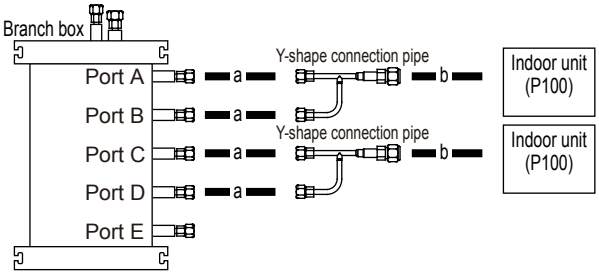
Piping connection size

	A	B
Liquid (mm)	ϕ9.52	The piping connection size differs according to the type and capacity of indoor units. Match the piping connection size of branch box with indoor unit. If the piping connection size of branch box does not match the piping connection size of indoor unit, use optional different-diameter (deformed) joints to the branch box side. (Connect deformed joint directly to the branch box side.)
Gas (mm)	ϕ15.88	

For P100 indoor units, the individual Y-shape connection pipes use 2 ports on the branch box as shown below.



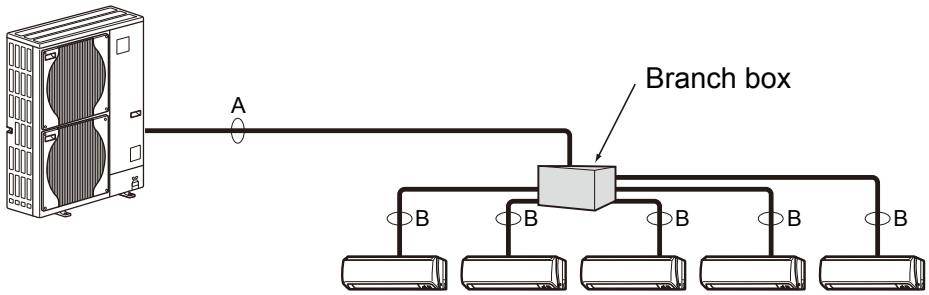
To connect a single P100 indoor unit, use port A and port B on the branch box.



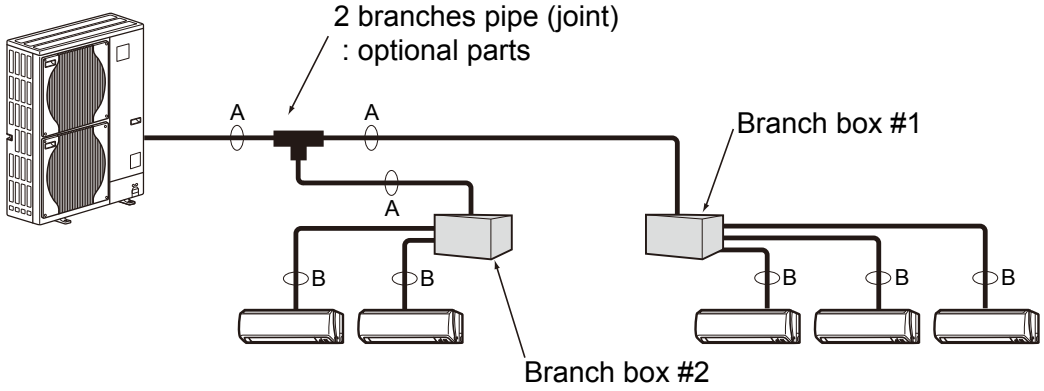
To connect two P100 indoor units, use port A and port B, and port C and port D on the branch box.

Flare connection employed. (No brazing!)

■ In case of using 1-branch box
Flare connection employed (No brazing)



■ In case of using 2-branch boxes



■ Installation procedure (2 branch pipe (joint))
Refer to the installation manuals of MSDD-50AR-E and MSDD-50BR-E.

3 SPECIFICATIONS

MXZ-8B140VA MXZ-8B140YA
MXZ-8B160VA MXZ-8B160YA

Conversion formula:	kcal/h = kW × 860
	Btu/h = kW × 3412
	CFM = m^3/min × 35.31

Service Ref.					MXZ-8B140VA	MXZ-8B160VA	MXZ-8B140YA	MXZ-8B160YA
Standard performance	Cooling	Rated Cooling capacity		kW	14.0	15.5	14.0	15.5
		Rated power consumption *1		kW	3.86	4.71	3.86	4.71
		Operating current *1		A	17.62/16.85/16.15	21.63/20.69/19.82	5.93/5.63/5.43	7.24/6.87/6.63
		Operating power factor *1		%	99.6	99.0	98.9	98.9
		Starting current (Outdoor unit)		A	14		7	
	Heating	Rated Heating capacity		kW	16.0	18.0	16.0	18.0
		Rated power consumption *1		kW	3.87	4.77	3.87	4.77
		Operating current *1		A	17.68/16.91/16.21	21.90/20.95/20.08	5.95/5.65/5.44	7.32/6.95/6.70
		Operating power factor *1		%	99.5	99.0	98.9	99.0
		Starting current (Outdoor unit)		A	14		7	
OUTDOOR UNIT	Breaker				Please refer to "9.ELECTRICAL WIRING"			
	Max. current (Outdoor unit only)			A	29.5		13	
	Power supply (phase, cycle, voltage)				Single, 50Hz, 220/230/240V		3-phase, 50Hz, 380/400/415V	
	External finish				Munsall 3Y 7.8/1.1			
	Refrigerant control				Linear Expansion Valve (In branch box)			
	Compressor				Hermetic			
		Model			ANB33FDSMT		ANB33FNBMT	
		Motor output		kW	2.9	3.3	2.9	3.3
		Starter type			Line start			
		Protection devices			HP switch, LP switch, Discharge thermo			
	Crankcase heater			W	–			
	Heat exchanger				Plate fin coil			
	Fan	Fan (drive) × No.			Propeller fan × 2			
		Fan motor output		kW	0.060+0.060			
		Airflow		m³/min (CFM)	100(3,530)	106(3,742)	100(3,530)	106(3,742)
	Defrost method				Reverse cycle			
	Noise level		Cooling	dB	50	51	50	51
			Heating	dB	52	54	52	54
	Dimensions		W	mm (in.)	950(37-3/8)			
			D	mm (in.)	330+30(13+1-3/16)			
			H	mm (in.)	1,350(53-1/8)			
	Weight			kg (lbs)	129(284)		139(306)	
	Refrigerant				R410A			
		Charge		kg (lbs)	8.5(18.7),40m			
		Oil (Model)		L	2.3(FV50S)			
REFRIGERANT PIPING	Pipe size O.D.		Liquid	mm	ϕ9.52			
			Gas	mm	ϕ15.88			
	Connection method		Indoor side		Flared			
			Outdoor side		Flared			

*1 Electrical data is only for outdoor unit.

Conversion formula

ϕ6.35mm	ϕ9.52mm	ϕ12.7mm	ϕ15.88mm	ϕ19.05mm
1/4 inch	3/8 inch	1/2 inch	5/8 inch	3/4 inch

Notes1. Rating Conditions (ISO T1)
Cooling : Indoor : D.B. 27°C (80°F), W.B. 19°C (66°F) Outdoor : D.B. 35°C (95°F), W.B. 24°C (75°F)
Heating : Indoor : D.B. 20°C (68°F) Outdoor : D.B. 7°C (45°F), W.B. 6°C (43°F)
Refrigerant piping length (one way) : Main Piping (From outdoor unit to branch box) : 5m
Branch Piping (From branch box to each indoor units) : each 3m

2. Guaranteed operating range

		Indoor		Outdoor
		P-series	M-series, S-series	
Cooling	Upper limit	D.B. 35°C, W.B. 22.5°C	D.B. 32°C, W.B. 23°C	D.B. 46°C
	Lower limit	D.B. 19°C, W.B. 15°C	D.B. 21°C, W.B. 15°C	D.B. –5°C
Heating	Upper limit	D.B. 28°C	D.B. 27°C	D.B. 21°C, W.B. 15°C
	Lower limit	D.B. 17°C	D.B. 20°C	D.B. –15°C, W.B. –15°C

3. Guaranteed voltage
MXZ-8B140/160VA: 198~264V, 50Hz
MXZ-8B140/160YA: 342~456V, 50Hz

4. Above data are based on the indicated voltage.
MXZ-8B140/160VA: Single, 50Hz, 220/230/240V
MXZ-8B140/160YA: 3-phase, 50Hz, 380/400/415V

5. Refer to the service manual of indoor unit for the indoor unit's specifications.

4 DATA

4-1. COOLING AND HEATING CAPACITY AND CHARACTERISTICS

4-1-1. Method for obtaining system cooling and heating capacity:

To obtain the system cooling and heating capacity and the electrical characteristics of the outdoor unit, first add up the ratings of all the indoor units connected to the outdoor unit (see table below), and then use this total to find the standard capacity with the help of the tables at the back of the manual "INDOOR UNITS COMBINATION SHEETS".

(1) Capacity of indoor unit

Model number for indoor unit	Model 15	Model 18	Model 20	Model 22	Model 25	Model 35	Model 42	Model 50	Model 60	Model 71	Model 80	Model 100
Model capacity	1.5	1.8	2.0	2.2	2.5	3.5	4.2	5.0	6.0	7.1	8.0	10.0

(2) Sample calculation

① System assembled from indoor and outdoor unit (in this example the total capacity of the indoor units is greater than that of the outdoor unit)

- Outdoor unit MXZ-8B140VA
- Indoor unit MSZ-EF25VE × 2 , PEAD-RP50JAQ × 2

② According to the conditions in ①, the total capacity of the indoor unit will be: 2.5 × 2 + 5.0 × 2 = 15.0

③ The following figures are obtained from the 150 total capacity row of the standard capacity diagram (INDOOR UNITS COMBINATION SHEETS: at the back of the manual).

Capacity (kW)		Outdoor unit power consumption (kW)		Outdoor unit current (A)/230V	
Cooling	Heating	Cooling	Heating	Cooling	Heating
Ⓐ 14.0	Ⓑ 16.0	5.22	5.01	22.9	22.0

4-1-2. Method for obtaining the heating and cooling capacity of an indoor unit:

(1) The capacity of each indoor unit (kW) = the capacity Ⓐ (or Ⓑ) × $\frac{\text{model capacity}}{\text{total model capacity of all indoor units}}$

(2) Sample calculation (using the system described above in 4-1-1. (2)):

During cooling:

- The total model capacity of the indoor unit is:
  2.5 × 2 + 5.0 × 2=15.0kW
  Therefore, the capacity of MSZ-EF25VE and PEAD-RP50JAQ will be calculated as follows by using the formula in 4-1-2. (1):

Model 25=14.0 × $\frac{2.5}{15.0}$ = 2.33kW

Model 50=14.0 × $\frac{5.0}{15.0}$ = 4.67kW

During heating:

- The total model capacity of indoor unit is:
  2.5 × 2 + 5.0 × 2=15.0
  Therefore, the capacity of MSZ-EF25VE and PEAD-RP50JAQ will be calculated as follows by using the formula in 4-1-2. (1):

Model 25=16.0 × $\frac{2.5}{15.0}$ = 2.67kW

Model 50=16.0 × $\frac{5.0}{15.0}$ = 5.33kW

4-2. CORRECTING COOLING AND HEATING CAPACITY

4-2-1. Correcting Changes in Air Conditions

(1) The performance curve charts (Figure 4-1, 4-2, 4-3, 4-4) show the change ratio of capacity and input (power consumption) according to the indoor and outdoor temperature condition when define the rated capacity (total capacity) and rated input under the standard condition in standard piping length (5 m) as “1.0”.

• Standard conditions:

Rated cooling capacity	Indoor D.B. 27 °C / W.B. 19 °C Outdoor D.B. 35 °C
Rated heating capacity	Indoor D.B. 20 °C Outdoor D.B. 7 °C / W.B. 6 °C

• Use the rated capacity and rated power values given in the characteristics table for each indoor unit.

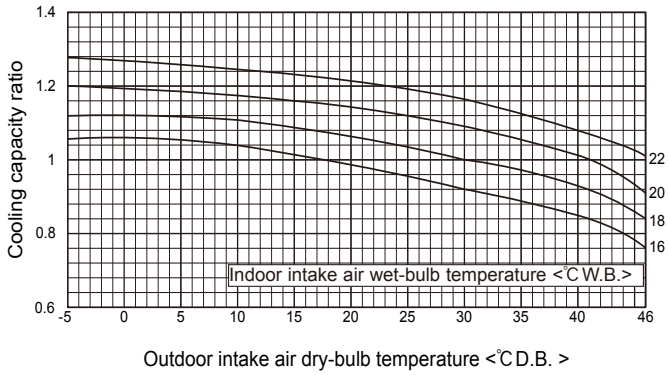
• The capacity is the single value on the side of the outdoor unit;
The capacity on the sides of each indoor unit must be added to obtain the total capacity.

(2) The capacity of each indoor unit may be obtained by multiplying the total capacity obtained in (1) by the ratio between the individual capacity at the rated time and the total capacity at the rated time.

$$\text{Individual capacity under stated conditions} = \text{Total capacity under the stated conditions} \times \frac{\text{Individual capacity at the rated time}}{\text{Total capacity at the rated time}}$$

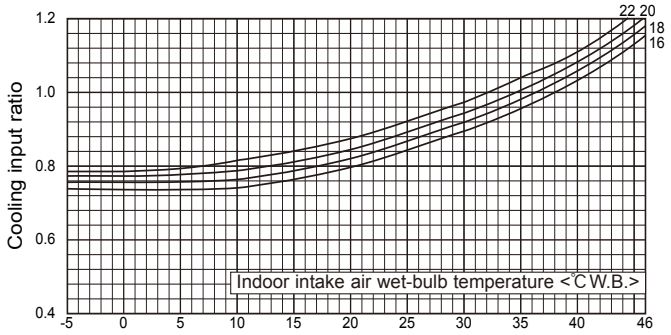
(3) Capacity correction factor curve

Fig. 4-1
Cooling capacity



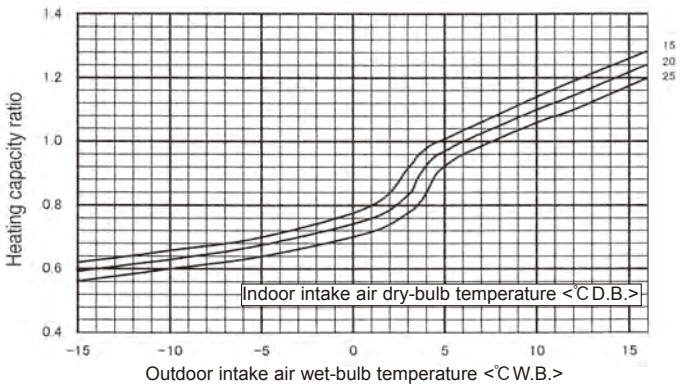
Outdoor intake air dry-bulb temperature <℃D.B. >

Fig. 4-2
Cooling input



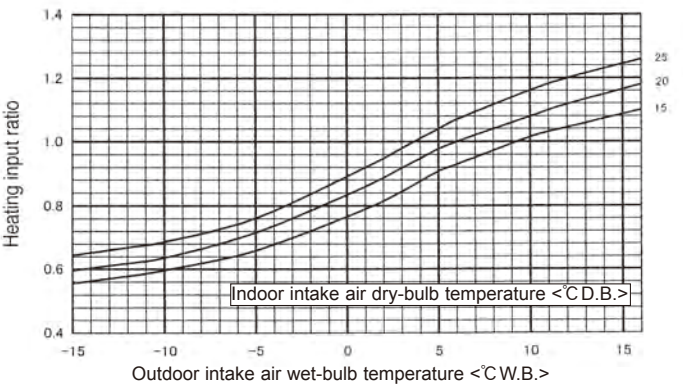
Outdoor intake air dry-bulb temperature <℃D.B. >

Fig. 4-3
Heating capacity



Outdoor intake air wet-bulb temperature <℃W.B.>

Fig. 4-4
Heating input



Outdoor intake air wet-bulb temperature <℃W.B.>

Note : These diagrams show the case where the operation frequency of a compressor is fixed.

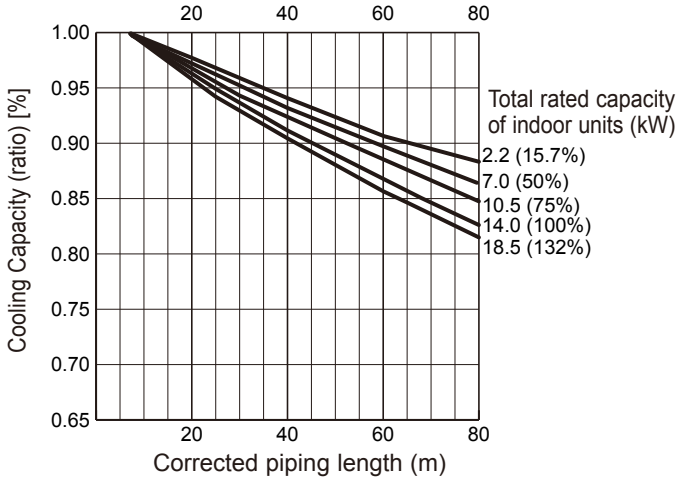
4-2-2. Correcting Capacity for Changes in the Length of Refrigerant Piping

To obtain the ratio (and the corrected piping length) of the outdoor units rated capacity and the total in-use indoor capacity, first find the capacity ratio corresponding to the standard piping length from Fig. 4-5, Fig. 4-6 and then multiply by the capacity from Fig. 4-1, 4-2, Fig. 4-3, 4-4 to obtain the actual capacity.

(1) Capacity correction factor

Fig. 4-5 Cooling capacity correction curve

MXZ-8B140VA, MXZ-8B140YA



MXZ-8B160VA, MXZ-8B160YA

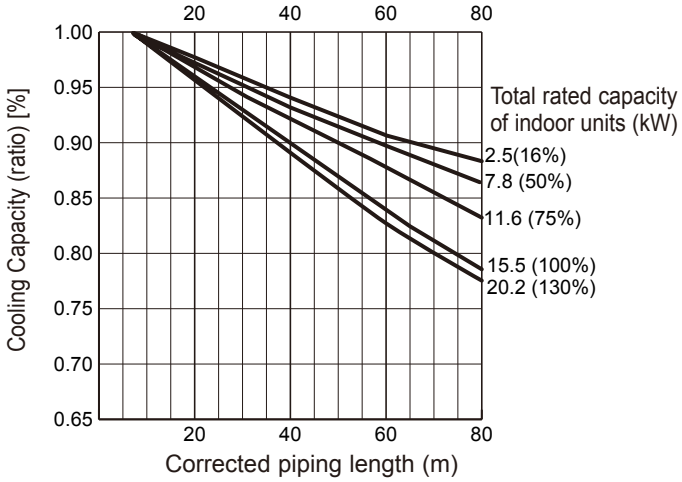
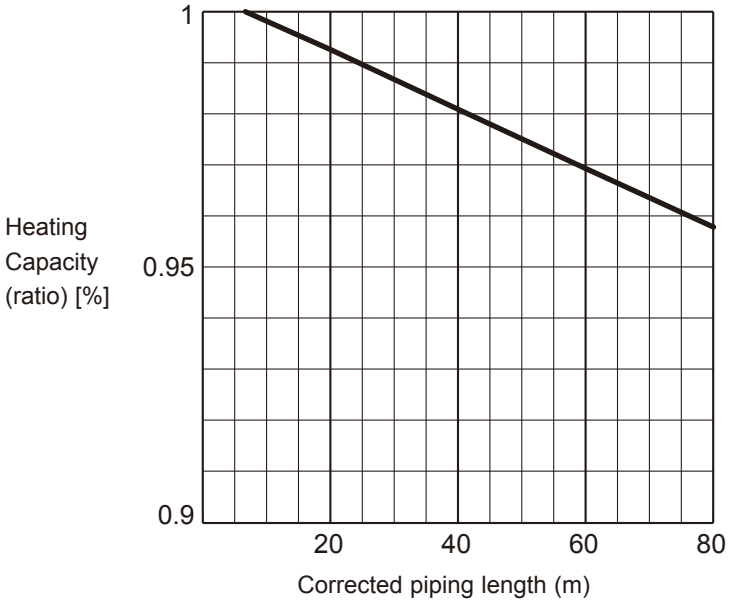


Fig. 4-6 Heating capacity correction curve

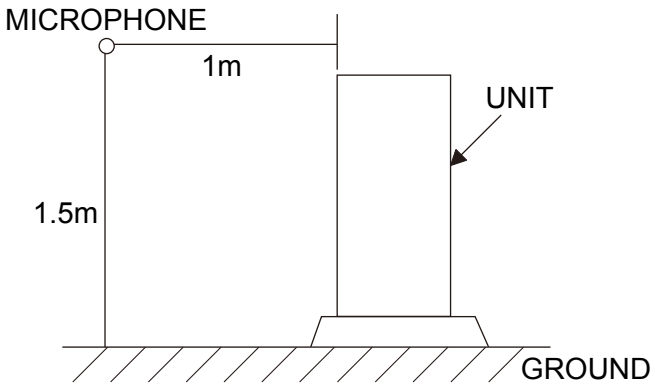
MXZ-8B140VA, MXZ-8B140YA, MXZ-8B160VA, MXZ-8B160YA



(2) Method for Obtaining the Corrected Piping Length

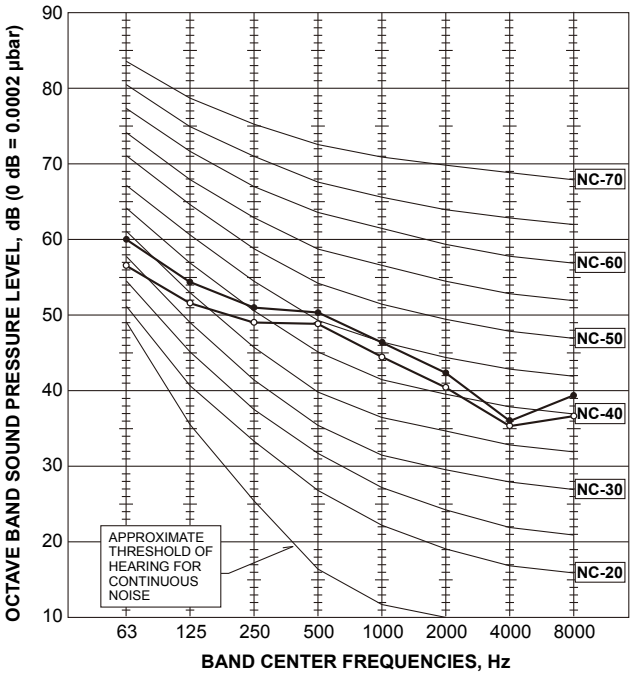
Corrected piping length = (Actual piping length between outdoor unit and the farthest indoor unit) + (0.30 × number of bends in the piping) (m)

4-3. NOISE CRITERION CURVES



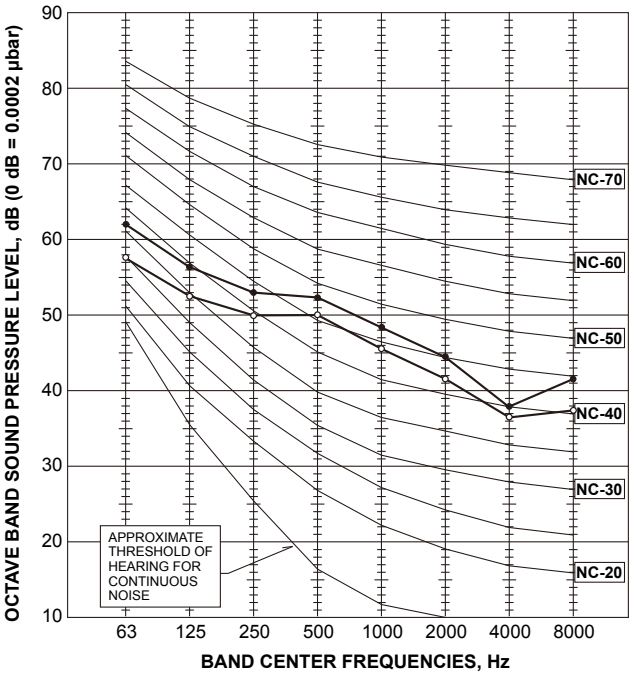
MXZ-8B140VA
MXZ-8B140YA

MODE	SPL(dB)	LINE
COOLING	50	○—○
HEATING	52	●—●



MXZ-8B160VA
MXZ-8B160YA

MODE	SPL(dB)	LINE
COOLING	51	○—○
HEATING	54	●—●



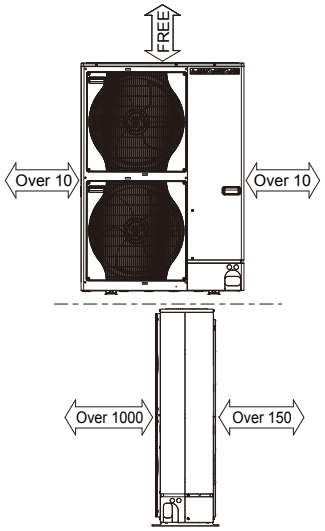
5 OUTLINES AND DIMENSIONS

MXZ-8B140VA MXZ-8B140YA MXZ-8B160VA MXZ-8B160YA

unit : mm

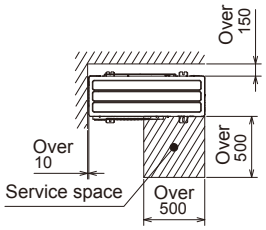
1 FREE SPACE (Around the unit)

The diagram below shows a basic example.
Explanation of particular details are given in the installation manuals etc.



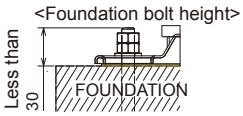
2 SERVICE SPACE

Dimensions of space needed for service access are shown in the below diagram.



3 FOUNDATION BOLTS

Please secure the unit firmly with 4 foundation (M10) bolts. (Bolts and washers must be purchased locally.)



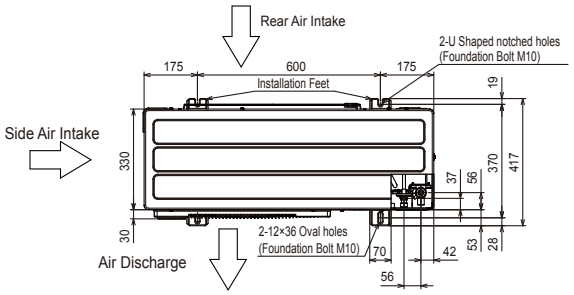
4 PIPING-WIRING DIRECTIONS

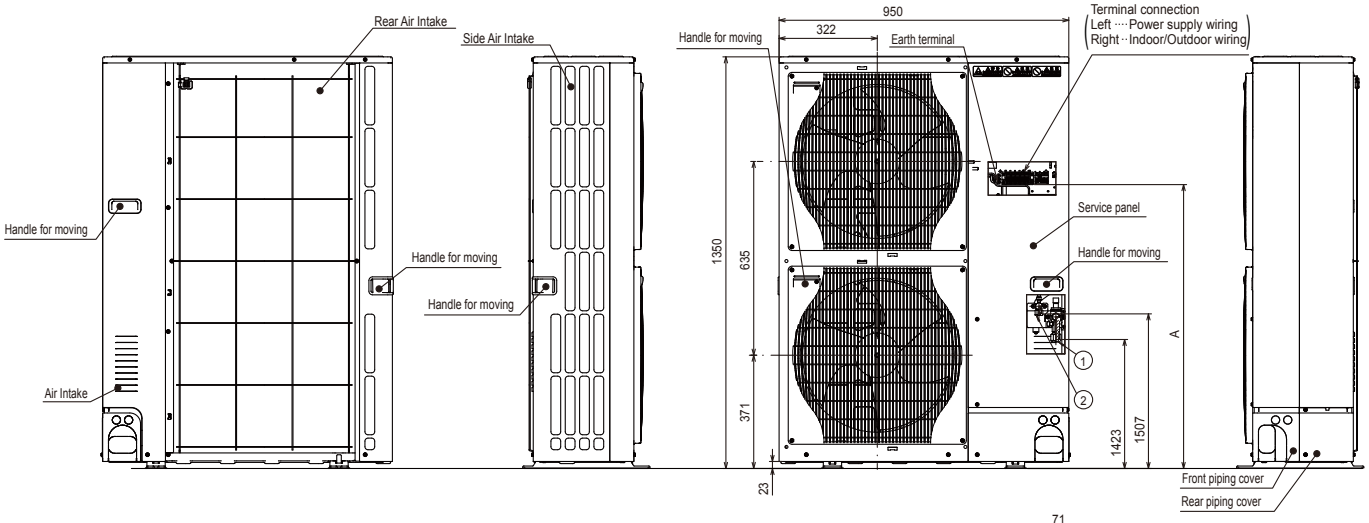
Piping and wiring connections can be made from 4 directions: front, right, rear and below.

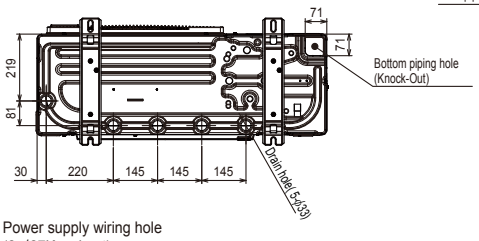
Example of Notes

①···Refrigerant GAS pipe connection (FLARE)ϕ15.88(5/8 inch)
②···Refrigerant LIQUID pipe connection (FLARE)ϕ9.52(3/8 inch)
Indication of STOP VALVE connection location

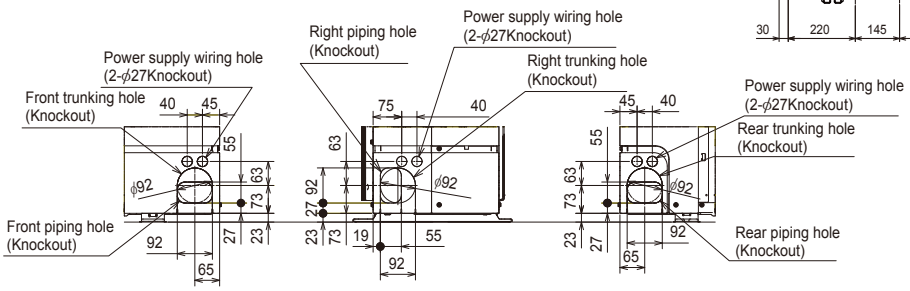
MODEL	A
MXZ-8B140VA/160VA	1079
MXZ-8B140YA/160YA	930







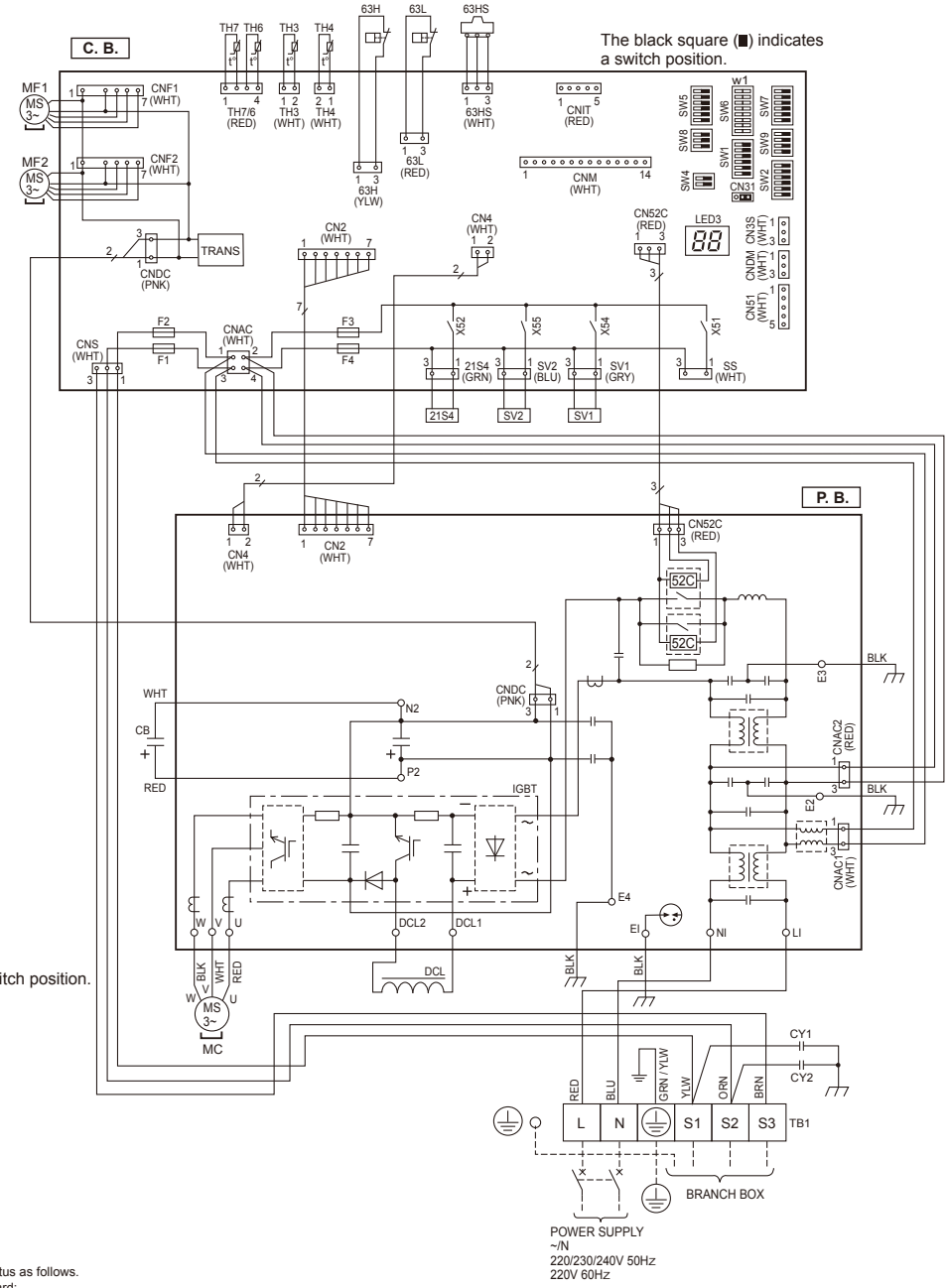
Piping Knockout Hole Details



6 WIRING DIAGRAM

MXZ-8B140VA MXZ-8B160VA

SYMBOL	NAME
TB1	Terminal Block <Power Supply, Branch Box>
MC	Motor for Compressor
MF1, MF2	Fan Motors
21S4	Solenoid Valve <Four-Way Valve>
63H	High Pressure Switch
63L	Low Pressure Switch
63HS	High Pressure Sensor
SV1,SV2	Solenoid Valve <Bypass Valve>
TH3	Thermistor <Outdoor Pipe>
TH4	Thermistor <Compressor>
TH6	Thermistor <Outdoor 2 - Phase Pipe>
TH7	Thermistor <Outdoor>
DCL	Reactor
CB	Main Smoothing Capacitor
CY1,CY2	Capacitor
P. B.	Power Circuit Board
U / V / W	Connection Terminal <U / V / W - Phase>
LI / NI	Connection Terminal <L / N - Phase>
P2,N2	Connection Terminal <CB>
DCL1,DCL2	Connection Terminal <DCL>
IGBT	Power Module
EI,E2,E3,E4	Connection Terminal <Ground>
52C	52C Relay
C. B.	Controller Circuit Board
SW1	Switch <Forced Defrost, Defect History Record Reset>
SW2	Switch <Self Diagnosis Switch>
SW4	Switch <Test Operation>
SW5	Switch <Function Switch>
SW6	Switch <Model Select>
SW7	Switch <Function Setup>
SW8	Switch <Function Setup>
SW9	Switch <Function Setup>
CN31	Connector
CN51	Connector <Connection for Option>
SS	Connector <Connection for Option>
CN3S	Connector <Connection for Option>
CNIT	Connector <Connection for Option>
CNDM	Connector <Connected for Option (Contact Input)>
LED3	Light Emitting Diode <Operation Inspection Indicators>
F1 ~ F4	Fuse <T6.3AL250V>
X51,X52,X54,X55	Relay



*1 **MODEL SELECT**

The black square (■) indicates a switch position.

MODEL	SW6
140V	ON / OFF 1 2 3 4 5 6 7 8
160V	ON / OFF 1 2 3 4 5 6 7 8

Operation / Inspection Display

LED on the controller board display the operation and inspection status as follows.
If LED does not light, it indicates that no power is supplied to the board:

	Details	Code
Power turned on		–⇔– (blinks)
Normal status		Operation status display, such as C5. H7
Faulty status (blinking)	63L connector (red) is open.	F3
	63H connector (yellow) is open.	F5
	2 connectors (63H/63L) are open.	F9
	Branch box/outdoor communication error (Signal receiving error)(Outdoor unit)	E8
	Indoor/branch box communication error (Signal receiving error)(Branch box)	
	Branch box/outdoor communication error (Transmitting error)(Outdoor unit)	E9
	Indoor/branch box communication error (Transmitting error)(Branch box)	
	•Mis-Wiring of indoor-branch box / branch box-outdoor unit connecting wire. •Too many indoor units / branch box are in the system.	EA
	Mis-wiring of indoor-branch box/branch box-outdoor unit connecting wire (converse wiring or disconnection)	Eb
	Startup time over	Ec
	Communication error except for outdoor unit	E0 - E7
	Combination errer, undefined error	EE, EF
	Serial communication error	Ed

Details	Code
Compressor temperature fault	U2
Low-discharge superheating fault, Erroneous connection of refrigerant pipes or the connecting wires	U7
High pressure fault (63H operates)	U1
Low pressure fault (63L operates)	UL
Abnormality of power moduls	U6
Compressor over current shutoff (Start up locked)	UF
Current sensor fault (P. B.)	UH
Compressor overcurrent shutoff fault	UP
Compressor thermistor (TH4) open or short-circuit	U3
Outdoor unit thermistors (TH3, TH6, TH7, and TH8), 63HS, and branch dox thermistors open or short-circuit	U4
Radiator panel temperature fault	U5
Abnormality in outdoor fan motor	U8
Voltage fault, current sensor fault	U9
Forced compressor stop (Overlap malfunction of drain pump in indoor unit and linear expansion valve in branch box)	PA

Cautions when Servicing

- ⚠WARNING:When the main supply is turned off, the voltage[340 V]in the main capacitor will drop to 20 V in approx. 2 minutes (input voltage : 240 V). when servicing, make sure that LED on the outdoor circuit board goes out, and then wait for at least 1 minute.
- Components other than the outdoor board may be faulty : Check and take corrective action, referring to the service manual. Do not replace the outdoor board without checking.

MXZ-8B140YA MXZ-8B160YA

SYMBOL	NAME
TB1	Terminal Block <Power Supply>
TB2	Terminal Block <Branch Box>
MC	Motor for Compressor
MF1, MF2	Fan Motors
21S4	Solenoid Valve <Four-Way Valve>
63H	High Pressure Switch
63L	Low Pressure Switch
63HS	High Pressure Sensor
SV1,SV2	Solenoid Valve <Bypass Valve>
TH3	Thermistor <Outdoor Pipe>
TH4	Thermistor <Compressor>
TH6	Thermistor <Outdoor 2 - Phase Pipe>
TH7	Thermistor <Outdoor>
ACL1~ACL4	Reactor
CB1, CB2	Main Smoothing Capacitor
CK	Capacitor
RS	Rush Current Protect Resistor
CY1,CY2	Capacitor
P. B.	Power Circuit Board
TB-U/V/W	Connection Terminal <U / V / W - Phase>
TB-L1/L2/L3	Connection Terminal <L1/L2/L3-Power Supply>
TB-P2	Connection Terminal
TB-C1	Connection Terminal
TB-N1	Connection Terminal
IGBT	Power Module
X52A	52C Relay
N. F.	Noise Filter Circuit Board
LI1/LI2/LI3/NI	Connection Terminal <L1/L2/L3/N-Power Supply>
LO1/LO2/LO3/NO	Connection Terminal <L1/L2/L3/N-Power Supply>
GD1, GD3	Connection Terminal <Ground>
CONV.B.	Controller Circuit Board
L1-A1 / IN	Connection Terminal <L1-Power Supply>
L1-A2 / OU	Connection Terminal <L1-Power Supply>
L2-A2 / OU	Connection Terminal <L2-Power Supply>
L3-A2 / OU	Connection Terminal <L3-Power Supply>
N-IN	Connection Terminal <N-Power Supply>
CK-OU	Connection Terminal <CK>
C. B.	Controller Circuit Board
SW1	Switch <Forced Defrost, Defect History Record Reset>
SW2	Switch <Self Diagnosis Switch>
SW4	Switch <Test Operation>
SW5	Switch <Function Switch>
SW6	Switch <Model Select>
SW7	Switch <Function Setup>
SW8	Switch <Function Setup>
SW9	Switch <Function Setup>
CN31	Connector
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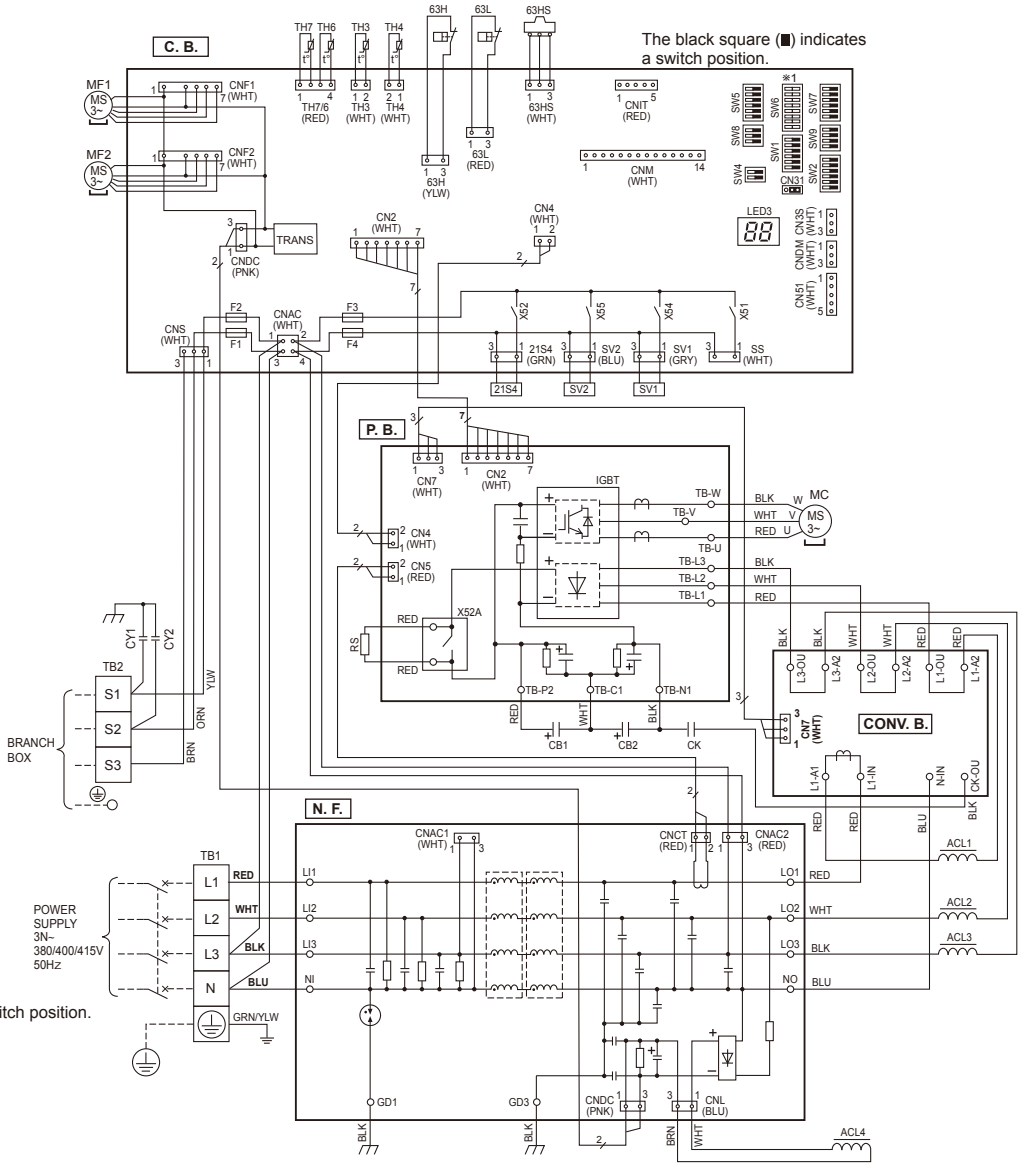
SS	Connector <Connection for Option>
CN3S	Connector <Connection for Option>
CNIT	Connector <Connection for Option>
CNDM	Connector <Connected for Option (Contact Input)>
LED3	Light Emitting Diode <Operation Inspection Indicators>
F1 ~ F4	Fuse <T6.3AL250V>
X51,X52,X54,X55	Relay



***1 MODEL SELECT**

The black square (■) indicates a switch position.

MODEL	SW6
140Y	ON OFF 1 2 3 4 5 6 7 8
160Y	ON OFF 1 2 3 4 5 6 7 8

Operation / Inspection Display

LED on the controller board display the operation and inspection status as follows.
If LED does not light, it indicates that no power is supplied to the board:

	Details	Code
Power turned on		−⇔− (blinks)
Normal status		Operation status display, such as C5. H7
Faulty status (blinking)	63L connector (red) is open.	F3
	63H connector (yellow) is open.	F5
	2 connectors (63H/63L) are open.	F9
	Branch box/outdoor communication error (Signal receiving error)(Outdoor unit)	E8
	Indoor/branch box communication error (Signal receiving error)(Branch box)	
	Branch box/outdoor communication error (Transmitting error)(Outdoor unit)	E9
	Indoor/branch box communication error (Transmitting error)(Branch box)	
	•Mis-Wiring of indoor-branch box / branch box-outdoor unit connecting wire. •Too many indoor units / branch box are in the system.	EA
	Mis-wiring of indoor-branch box/branch box-outdoor unit connecting wire (converse wiring or disconnection)	Eb
	Startup time over	Ec
	Communication error except for outdoor unit	E0 - E7
	Combination errer, undefined error	EE, EF
	Serial communication error	Ed

Details	Code
Compressor temperature fault	U2
Low-discharge superheating fault, Erroneous connection of refrigerant pipes or the connecting wires	U7
High pressure fault (63H operates)	U1
Low pressure fault (63L operates)	UL
Abnormality of power moduls	U6
Compressor over current shutoff (Start up locked)	UF
Current sensor fault (P. B.)	UH
Compressor overcurrent shutoff fault	UP
Compressor thermistor (TH4) open or short-circuit	U3
Outdoor unit thermistors (TH3, TH6, TH7), 63HS, and branch dox thermistors open or short-circuit	U4
Radiator panel temperature fault	U5
Abnormality in outdoor fan motor	U8
Voltage fault, current sensor fault	U9
Forced compressor stop (Overlap malfunction of drain pump in indoor unit and linear expansion valve in branch box)	PA

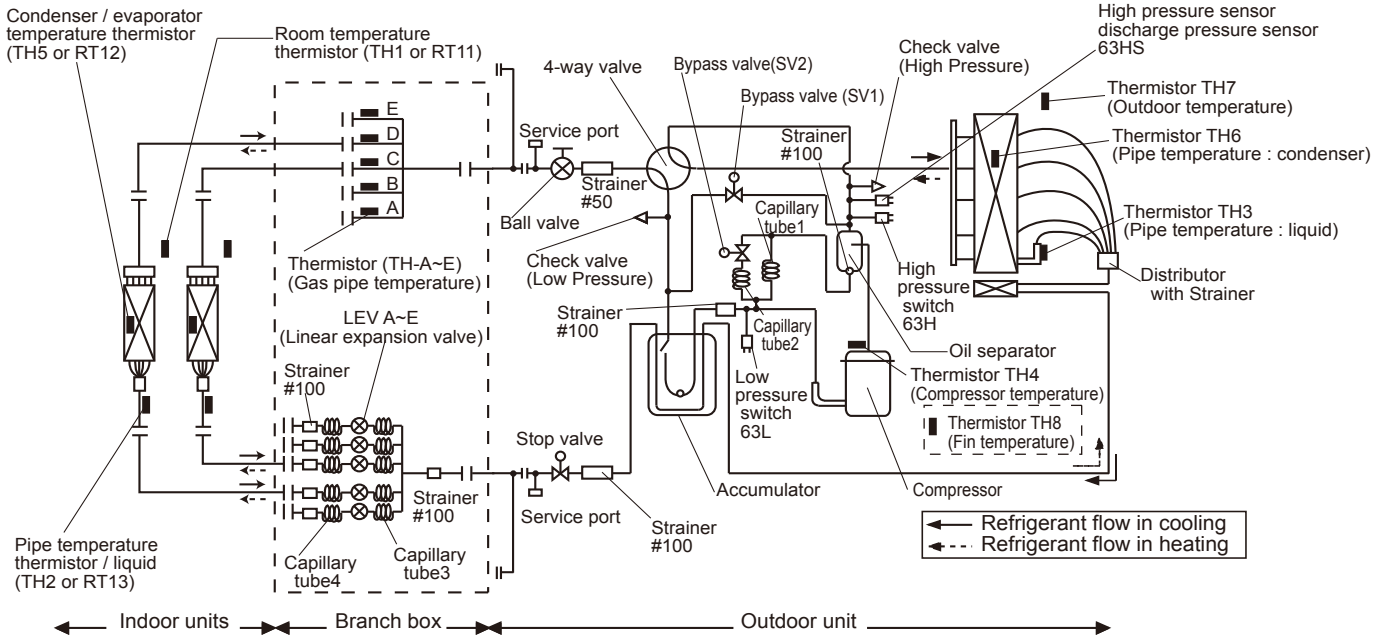
Cautions when Servicing

- ⚠WARNING:When the main supply is turned off, the voltage[540 V]in the main capacitor will drop to 20 V in approx.5 minutes (input voltage : 380 V). when servicing, make sure that LED on the outdoor circuit board goes out, and then wait for at least 5 minute.
- Components other than the outdoor board may be faulty : Check and take corrective action, referring to the service manual. Do not replace the outdoor board without checking.

7 NECESSARY CONDITIONS FOR SYSTEM CONSTRUCTION

REFRIGERANT SYSTEM DIAGRAM

MXZ-8B140VA MXZ-8B140YA MXZ-8B160VA MXZ-8B160YA



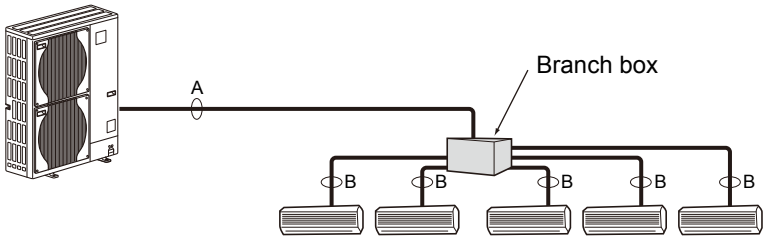
unit : mm

		Capillary tube 1 (For return of oil from oil separator)	Capillary tube 2 (For SV2)	Capillary tube 3 ahead of LEV (in cooling mode)	Capillary tube 4 behind LEV (in cooling mode)
Outdoor unit	MXZ-8B140VA MXZ-8B160VA MXZ-8B140YA MXZ-8B160YA	ϕ2.5 × ϕ0.8 × L1000	ϕ4 × ϕ2.4 × L250	———	———
Branch box	PAC-AK53BC	———	———	(ϕ4 × ϕ2.4 × L140) × 5	(ϕ4 × ϕ2.2 × L130) × 5
	PAC-AK32BC	———	———	(ϕ4 × ϕ2.4 × L140) × 3	(ϕ4 × ϕ2.2 × L130) × 3

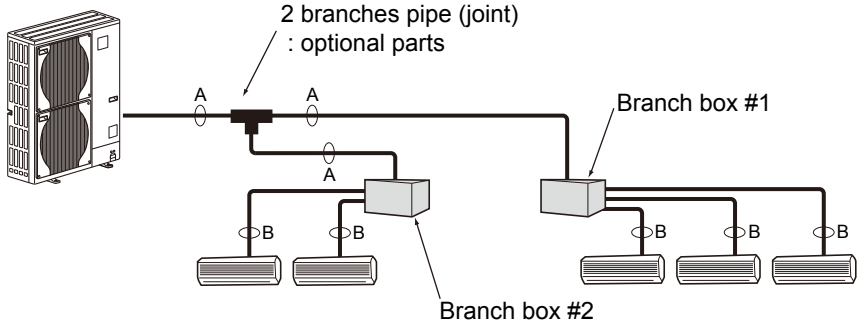
Piping connection size

	A	B
Liquid (mm)	ϕ9.52	The pipe connection size differs according to the type and capacity of indoor units. Match the piping connection size of branch box with indoor unit. If the piping connection size of branch box does not match the piping connection size of indoor unit, use optional different-diameter (deformed) joints to the branch box side. (Connect deformed joint directly to the branch box side.)
Gas (mm)	ϕ15.88	

■ In case of using 1-branch box
Flare connection employed (No brazing)



■ In case of using 2-branch boxes



■ installation procedure (2 branch pipe (joint))
Refer to the installation manuals of MSDD-50AR-E and MSDD-50BR-E.

■ Pipe size (Branch box-Indoor unit) *For M series or S series Indoor unit

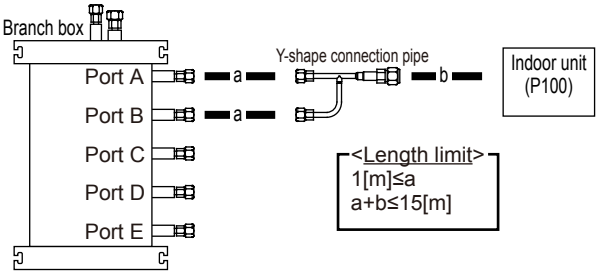
Indoor unit type	(kW)	15	18	20	22	25	35	42	50	60	71	80
Pipe size (mm)	Liquid	ϕ6.35	ϕ6.35	ϕ6.35	ϕ6.35	ϕ6.35	ϕ6.35	ϕ6.35	ϕ6.35	ϕ6.35	ϕ9.52	ϕ9.52
	Gas	ϕ9.52	ϕ9.52	ϕ9.52	ϕ9.52	ϕ9.52	ϕ9.52	ϕ9.52	ϕ12.7	ϕ15.88 *	ϕ15.88	ϕ15.88

When using 60 type indoor unit of MEXZ series, use the flare nut in the indoor unit accessory for the gas side connecting of indoor unit.
Do not use the flare nut (gas side) attached to the indoor unit. If it is used, a gas leakage or even a pipe extraction may occur.

■ Pipe size (Branch box-Indoor unit) *For P series Indoor unit

Indoor unit type	(kW)	35	50	60	71	100※
Pipe size (mm)	Liquid	ϕ6.35	ϕ6.35	ϕ9.52	ϕ9.52	ϕ9.52
	Gas	ϕ12.7	ϕ12.7	ϕ15.88	ϕ15.88	ϕ15.88

When using 35, 50 type indoor unit of P series, use the flare nut (for R410A) attached to the indoor unit.
Do not use the flare nut (for R407C) in the indoor unit accessory. If it is used, a gas leakage or even a pipe extraction may occur.
*** For the connection of P100 indoor unit(s), use the refrigerant pipes specified in the table below.**



Distance between branch box and Y-shape connection pipe (=a)	Liquid		Gas	
	a	b	a	b
1 to 10 [m]	ϕ6.35	ϕ9.52	ϕ9.52	ϕ15.88
10 [m] or more	ϕ6.35	ϕ9.52	ϕ12.7 *1	ϕ15.88

*1 To connect a ϕ12.7 gas pipe, use a joint pipe (MAC-A454JP)

(1) Valve size for outdoor unit

For liquid	ϕ9.52 mm
For gas	ϕ15.88 mm

(2) Valve size for branch unit

* Ⓐ UNIT	Liquid pipe	ϕ6.35 mm
	Gas pipe	ϕ9.52 mm
* Ⓑ UNIT	Liquid pipe	ϕ6.35 mm
	Gas pipe	ϕ9.52 mm
* Ⓒ UNIT	Liquid pipe	ϕ6.35 mm
	Gas pipe	ϕ9.52 mm
Ⓓ UNIT	Liquid pipe	ϕ6.35 mm
	Gas pipe	ϕ9.52 mm
Ⓔ UNIT	Liquid pipe	ϕ6.35 mm
	Gas pipe	ϕ12.7 mm

* 3- branch type is only for Ⓐ, Ⓑ, and Ⓒ unit.

Different-diameter joint (optional parts) (Fig.7-1)

Model name	Connected pipes diameter mm	Diameter A mm	Diameter B mm
MAC-A454JP	ϕ9.52 → ϕ12.7	ϕ9.52	ϕ12.7
MAC-A455JP	ϕ12.7 → ϕ9.52	ϕ12.7	ϕ9.52
MAC-A456JP	ϕ12.7 → ϕ15.88	ϕ12.7	ϕ15.88
PAC-493PI	ϕ6.35 → ϕ9.52	ϕ6.35	ϕ9.52
PAC-SG76RJ-E	ϕ9.52 → ϕ15.88	ϕ9.52	ϕ15.88

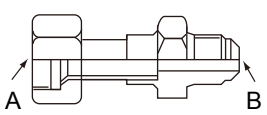


Fig.7-1

Conversion formula

1/4 inch	ϕ6.35mm
3/8 inch	ϕ9.52mm
1/2 inch	ϕ12.7mm
5/8 inch	ϕ15.88mm
3/4 inch	ϕ19.05mm

Y-shape connection pipe for 100 type indoor unit (optional parts) (Fig.7-2)

Model name		Connected pipe diameter mm	Diameter A mm	Diameter B mm
PAC-AK52YP-E	Liquid	ø6.35 → ø9.52	ø6.35	ø9.52
	Gas	ø9.52 → ø15.88	ø9.52	ø15.88

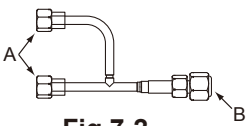


Fig.7-2

8 TROUBLESHOOTING

8-1. TROUBLESHOOTING

<Check code display by self-diagnosis and actions to be taken for service (summary)>
Present and past check codes are logged and displayed on the wired remote controller and control board of outdoor unit. Actions to be taken for service, which depends on whether or not the trouble is reoccurring at service, are summarized in the table below. Check the contents below before investigating details.

Unit conditions at service	Check code	Actions to be taken for service (summary)
The trouble is reoccurring.	Displayed	Judge what is wrong and take a corrective action according to “8-3. SELF-DIAGNOSIS ACTION TABLE”.
	Not displayed	Conduct trouble shooting and ascertain the cause of the trouble according to “8-4. TROUBLESHOOTING OF PROBLEMS”.
The trouble is not reoccurring.	Logged	①Consider the temporary defects such as the work of protection devices in the refrigerant circuit including compressor, poor connection of wiring, noise, etc. Re-check the symptom, and check the installation environment, refrigerant amount, weather when the trouble occurred, matters related to wiring, etc. ②Reset check code logs and restart the unit after finishing service. ③There is no abnormality concerning of parts such as electrical component, controller board, remote controller, etc.
	Not logged	①Re-check the abnormal symptom. ②Conduct trouble shooting and ascertain the cause of the trouble according to “8-4. TROUBLESHOOTING OF PROBLEMS”. ③Continue to operate unit for the time being if the cause is not ascertained. ④There is no abnormality concerning of parts such as electrical component, controller board, remote controller, etc.

8-2. CHECK POINTS FOR TEST RUN

8-2-1. Before test run

- Turn on the main power switch more than 12 hours before starting operation. Starting operation just after turning on the power switch can severely damage the internal parts. Keep the main power switch turned on during the operation season.
- After completing installation and the wiring and piping of the indoor and outdoor units, check for refrigerant leakage, looseness in the power supply or control wiring, wrong polarity, and no disconnection of one phase in the supply.
- Use a 500-volt M-ohm tester to check that the resistance between the power supply terminals and ground is at least 1 MΩ.
- Do not carry out this test on the control wiring (low voltage circuit) terminals.

⚠ **Warning: Do not use the air conditioner if the insulation resistance is less than 1 MΩ.**

Insulation resistance

After installation or after the power source to the unit has been cut for an extended period, the insulation resistance will drop below 1 MΩ due to refrigerant accumulating in the compressor. This is not a malfunction. Perform the following procedures.

1. Remove the wires from the compressor and measure the insulation resistance of the compressor.
2. If the insulation resistance is below 1 MΩ, the compressor is faulty or the resistance dropped due to the accumulation of refrigerant in the compressor.
3. After connecting the wires to the compressor, the compressor will start to warm up after power is supplied. After supplying power for the times indicated below, measure the insulation resistance again.
   - The insulation resistance drops due to accumulation of refrigerant in the compressor. The resistance will rise above 1MΩ after the compressor is warmed up for 4 hours. (The time necessary to warm up the compressor varies according to atmospheric conditions and refrigerant accumulation.)
   - To operate the compressor with refrigerant accumulated in the compressor, the compressor must be warmed up at least 12 hours to prevent breakdown.
4. If the insulation resistance rises above 1 MΩ, the compressor is not faulty.

⚠ **Caution:**

- **The compressor will not operate unless the power supply phase connection is correct.**
- **Turn on the power at least 12 hours before starting operation.**
  Staring operation immediately after turning on the main power switch can result in severe damage to internal parts.
  Keep the power switch turned on during the operational season.

● **The followings must be checked as well.**

- The outdoor unit is not faulty. LED on the control board of the outdoor unit flashes when the outdoor unit is faulty.
- Both the gas and liquid stop valves are completely open.

8-2-2. Test run

(1) Using remote controller

Refer to the indoor unit installation manual.

- Be sure to perform the test run for each indoor unit. Make sure each indoor unit operates properly following the installation manual attached to the unit.
- If you perform the test run for all indoor units at once, you cannot detect any erroneous connection, if any, of the refrigerant pipes and the connecting wires.
  * The compressor operation is not available for 3 minutes at least after the power is supplied.
- The compressor can emit noise just after turn on the power supply or in case of low outside air temperature.

About the restart protective mechanism

Once the compressor stops, the restart preventive device operates so the compressor will not operate for 3 minutes to protect the air conditioner.

(2) Using SW4 in outdoor unit

In case of the test run from outdoor unit, all indoor units operate. Therefore, you cannot detect any erroneous connection of refrigerant pipes and the connecting wires. If it aims at detection of any erroneous connection, be sure to carry out the test run from remote controller with reference to "(1) Using remote controller."

SW4-1	ON	Cooling operation
SW4-2	OFF	
SW4-1	ON	Heating operation
SW4-2	ON	

Note: After performing the test run, set SW4-1 to OFF.

• A few seconds after the compressor starts, a clanging noise may be heard from the inside of the outdoor unit. The noise is coming from the check valve due to the small difference in pressure in the pipes. The unit is not faulty.
The test run operation mode cannot be changed by DIP switch SW4-2 during the test run. To change the test run operation mode during the test run, stop the test run by DIP switch SW4-1. After changing the test run operation mode, resume the test run by switch SW4-1.

When a test run is started by "Using SW4 in outdoor unit", even if it carries out stop instructions by remote controller, outdoor unit does not stop. A test run is not ended.
In this case, please set SW4 in outdoor unit to off.

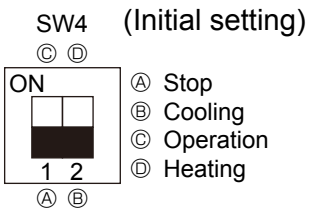
• After power is supplied or after an operation stop for a while, a small clicking noise may be heard from the inside of the branch box. The electronic expansion valve is opening and closing. The unit is not faulty.

Note: Be sure to wait at least 3 minutes after turning on the power supply before setting SW4-1 and SW4-2.
If the DIP switches are set before 3 minutes have elapsed, the test run may not start.

8-2-3. Test run by outdoor unit SW4

The setting of test run (ON/OFF) and its operation mode (cooling/heating) can be set by SW4 on the controller board of outdoor unit.

① Set operation mode (cooling or heating) by SW4-2.
② Start test run by setting SW4-1 to ON (⤒) with the indicated operation mode of SW4-2.
③ Finish test run by setting SW4-1 to OFF (⤓).



- Operation mode cannot be changed by SW4-2 during test run.
  Stop test run to change operation mode by SW4-1, and restart test run by SW4-1 after the mode is changed.
- Test run automatically stops 2 hours later by 2-hour OFF timer function.
- Test run can be performed by the remote controller.
- The remote controller display of test run by outdoor unit is the same as that of test run by remote controller.
- If test run is set with the outdoor unit, the test run is performed for all indoor units.
- The remote controller operation becomes unavailable once the test run is set with the outdoor unit.

During the test run set with the outdoor unit, operation on/off or operation mode change cannot be performed by the remote controller, and the operation relating to the test run which is made with the outdoor unit will be prior to any other commands from the remote controller. Set the SW4-1 to OFF (⤓) to finish test run.
Emergency operation is not available for this model.

8-3. SELF-DIAGNOSIS ACTION TABLE

<Abnormalities detected when the power is put on> (Note 1) Refer to indoor unit section for code P and code E.

Check code	Abnormal point and detection method	Case	Judgment and action
None	—	① No voltage is supplied to terminal block (TB1) of outdoor unit. a) Power supply breaker is turned off. b) Contact failure or disconnection of power supply terminal c) Open phase (L or N phase)	① Check following items. a) Power supply breaker b) Connection of power supply terminal block. (TB1) c) Connection of power supply terminal block. (TB1)
		② Electric power is not charged to power supply terminal of outdoor power circuit board. a) Contact failure of power supply terminal b) Open phase on the outdoor power circuit board Disconnection of connector SC-R or SC-S	② Check following items. a) Connection of power supply terminal block. (TB1) b) Connection of terminal on outdoor power circuit board. Disconnection of connector SC-R or SC-S Refer to "8-7. TEST POINT DIAGRAM".
		③ Electric power is not supplied to outdoor controller circuit board. a) Disconnection of connector (CNDC)	③ Check connection of the connector (CNDC) on the outdoor controller circuit board. Check connection of the connector, CNDC on the outdoor power circuit board. Refer to "8-7. TEST POINT DIAGRAM".
		④ Disconnection of reactor (DCL)	④ Check connection of reactor. (DCL) Check connection of “L1” and “L2” on the active filter module. (ACTM)
		⑤ Disconnection of outdoor noise filter circuit board or parts failure in outdoor noise filter circuit board	⑤ a) Check connection of outdoor noise filter circuit board. b) Replace outdoor noise filter circuit board. Refer to "8-7. TEST POINT DIAGRAM".
		⑥ Defective outdoor power circuit board	⑥ Replace outdoor power circuit board.
		⑦ Defective outdoor controller circuit board	⑦ Replace controller board (When items above are checked but the units cannot be repaired.)
F3 (5202)	**63L connector open** Abnormal if 63L connector circuit is open for 3 minutes continuously after power supply 63L: Low-pressure switch	① Disconnection or contact failure of 63L connector on outdoor controller circuit board ② Disconnection or contact failure of 63L ③ 63L is operating due to refrigerant leakage or defective parts. ④ Defective outdoor controller circuit board	① Check connection of 63L connector on outdoor controller circuit board. Refer to "8-7. TEST POINT DIAGRAM". ② Check the 63L side of connecting wire. ③ Check refrigerant pressure. Charge additional refrigerant. Check continuity by tester. Replace the parts if the parts are defective. ④ Replace outdoor controller circuit board.
F5 (5201)	**63H connector open** Abnormal if 63H connector circuit is open for 3 minutes continuously after power supply 63H: High-pressure switch	① Disconnection or contact failure of 63H connector on outdoor controller circuit board ② Disconnection or contact failure of 63H ③ 63H is operating due to defective parts. ④ Defective outdoor controller circuit board	① Check connection of 63H connector on outdoor controller circuit board. Refer to "8-7. TEST POINT DIAGRAM". ② Check the 63H side of connecting wire. ③ Check continuity by tester. Replace the parts if the parts are defective. ④ Replace outdoor controller circuit board.
F9 (4119)	**2 connector open** Abnormal if both 63H and 63L connector circuits are open for 3 minutes continuously after power supply 63H: High-pressure switch 63L: Low-pressure switch	① Disconnection or contact failure of connector (63H, 63L) on outdoor controller circuit board. ② Disconnection or contact failure of 63H, 63L ③ 63H and 63L are operating due to defective parts. ④ Defective outdoor controller board	① Check connection of connector (63H,63L) on outdoor controller circuit board. Refer to "8-7. TEST POINT DIAGRAM". ② Check the 63H and 63L side of connecting wire. ③ Check continuity by tester. Replace the parts if the parts are defective. ④ Replace outdoor controller circuit board.

Check code	Abnormal point and detection method	Case	Judgment and action
EA (6844)	**Indoor–branch box/branch box–outdoor unit connector miswiring, excessive number of units** Outdoor/branch box controller circuit board can automatically check the number of connected indoor units. Abnormal if the number cannot be checked automatically due to miswiring of indoor– branch box/ branch box–outdoor unit connecting wire and etc. after power is turned on for 4 minutes.	① Contact failure or miswiring of indoor/outdoor unit connecting wire	① Check disconnection or looseness or polarity of indoor–branch box/branch box–outdoor unit connecting wire of indoor and outdoor units. Before connecting P100 indoor unit(s), check the requirements described in "9-2. WIRING TO P100 INDOOR UNITS".
		② Diameter or length of indoor–branch box/branch box–outdoor unit connecting wire is out of specified capacity. There are 9 or more indoor units in the system. There are 3 or more branch boxes in the system. More than two P100 indoor units are connected to the branch box.	② Check diameter and length of indoor–branch box/branch box–outdoor unit connecting wire. Total wiring length: 55 m (outdoor–branch box) (including wiring connecting each branch box unit and between branch box and outdoor unit) Also check if the connection order of flat cable is S1, S2, S3. If the error “EA” is detected, check the number of the indoor units, the branch box and P100 indoor unit(s) in the system.
		③ Defective transmitting receiving circuit of outdoor/branch box controller circuit board ④ Defective transmitting receiving circuit of branch box/indoor controller board ⑤ Defective branch box/indoor power board	③–⑤ Turn the power off once, and on again to check. Replace outdoor controller circuit board, branch box controller board, indoor controller board or indoor power board if abnormality occurs again.
		⑥ Noise has entered into power supply or indoor–branch box/ branch box–outdoor unit connecting wire.	⑥ Check transmission path, and remove the cause. Note: The descriptions above, ①-⑥, are for EA, Eb and EC.
Eb (6845)	**Miswiring of indoor–branch box/branch box–outdoor unit connecting wire (converse wiring or disconnection)** Outdoor/branch box controller circuit board can automatically set the unit number of indoor units. Abnormal if the indoor unit number can not be set within 4 minutes after power on because of miswiring (converse wiring or disconnection) of indoor–branch box/ branch box–outdoor unit connecting wire.	① Contact failure or miswiring of indoor–branch box/branch box –outdoor unit connecting wire ② Diameter or length of indoor–branch box/branch box–outdoor unit connecting wire is out of specified capacity. ④ Defective transmitting receiving circuit of outdoor/branch box controller circuit board ⑤ Defective transmitting receiving circuit of indoor/branch box controller board ⑥ Defective indoor/branch box power board ⑦ Noise has entered into power supply or indoor–branch box/ branch box–outdoor unit connecting wire.	
EC (6846)	**Start-up time over** The unit cannot finish start-up process within 4 minutes after power on.	① Contact failure of indoor–branch box/branch box–outdoor unit connecting wire ② Diameter or length of indoor–branch box/branch box–outdoor unit connecting wire is out of specified capacity. ③ Noise has entered into power supply or indoor–branch box/ branch box–outdoor unit connecting wire.	

Check code	Abnormal point and detection method	Case	Judgment and action
EE (7130)	**Faulty connection of LEV** For the connection of P100 indoor unit(s), the connecting wire(s) must be connected to the specified terminal block(s) in the branch box. Incorrect wiring	① Contact failure or miswiring of indoor/outdoor unit connecting wire The connecting wire(s) from P100 indoor unit(s) are not connected to the specified terminal block(s) in the branch box. The connecting wire(s) from P100 indoor unit(s) are connected to an incorrect terminal block(s) in the branch box.	① Check disconnection or looseness or polarity of indoor–branch box/branch box–outdoor unit connecting wire of indoor and outdoor units. Before connecting P100 indoor unit(s), check the requirements described in "9-2. WIRING TO P100 INDOOR UNITS".
		② Diameter or length of indoor–branch box/branch box–outdoor unit connecting wire is out of specified capacity.	② Check diameter and length of indoor–branch box/branch box–outdoor unit connecting wire. Total wiring length: 55 m (outdoor–branch box) (including wiring connecting each branch box unit and between branch box and outdoor unit) Also check if the connection order of flat cable is S1, S2, S3. If the error “EA” is detected, check the number of the indoor units, the branch box and P100 indoor unit(s) in the system.
		③ Defective transmitting receiving circuit of outdoor/branch box controller circuit board ④ Defective transmitting receiving circuit of branch box/indoor controller board ⑤ Defective branch box/indoor power board	③–⑤ Turn the power off once, and on again to check. Replace outdoor controller circuit board, branch box controller board, indoor controller board or indoor power board if abnormality occurs again.
		⑥ Noise has entered into power supply or indoor–branch box/branch box–outdoor unit connecting wire.	⑥ Check transmission path, and remove the cause. Note: The descriptions above, ①-⑥, are for EA, Eb and EC.

<Abnormalities detected while unit is operating>

Check code	Abnormal point and detection method	Case	Judgment and action
U1 (1302)	**(1) High-pressure switch (63H) operated** Abnormal if high-pressure switch 63H operated (*) during compressor operation. * 4.15 MPa 63H: High-pressure switch **(2) High pressure** (High - pressure sensor 63HS detect) ① When high-pressure sensor detects 4.31MPa or more (or over 4.15MPa for 3 minutes) (1st detection) during the compressor operation, the compressor stops and restarts operation in 3 minutes. ② When the sensor detects 4.31MPa or more (or over 4.15MPa for 3 minutes) again (2nd detection) within 30 minutes since the compressor has stopped, the compressor stops again and restarts operation in 3 minutes. ③ When the sensor detects 4.31MPa or more (or over 4.15MPa for 3 minutes) again (3rd detection) within 30 minutes since the compressor has stopped, the compressor stops again and restarts operation in 3 minutes. ④ When the sensor detects 4.31MPa or more (or over 4.15MPa for 3 minutes) again (4th detection) within 30 minutes after 3rd compressor stop, it stops abnormally. In this time <U1> is displayed. ⑤ When the sensor detects 4.31MPa or more (or over 4.15MPa for 3 minutes) after 30 minutes since the compressor has stopped (1st or 2nd or 3rd time), it becomes the 1st detection or the same performance as above-mentioned ①. ⑥ It is being delay for abnormal stop during 30 minutes since the compressor has stopped. In this time, check delay code <U1> will be displayed.	1) Short cycle of indoor unit 2) Clogged filter of indoor unit 3) Decreased airflow caused by dirt of indoor fan 4) Dirt of indoor heat exchanger 5) Locked indoor fan motor 6) Malfunction of indoor fan motor 7) Defective operation of stop valve (Not fully opened) 8) Clogged or broken pipe 9) Locked outdoor fan motor 10) Malfunction of outdoor fan motor 11) Short cycle of outdoor unit 12) Dirt of outdoor heat exchanger 13) Decreased airflow caused by defective inspection of out side temperature thermistor (It detects lower temperature than actual temperature.) 14) Disconnection or contact failure of connector (63H) on outdoor controller board 15) Disconnection or contact failure of 63H connection 16) Defective outdoor controller board 17) Defective action of linear expansion valve 18) Malfunction of fan driving circuit 19) Solenoid valve (SV1) performance failure (High-pressure cannot be controlled by SV1) 20) High-pressure sensor defective 21) High-pressure sensor input circuit defective in multi controller board	1)–6) Check indoor unit and repair defect. 7) Check if stop valve is fully open. 8) Check piping and repair defectives. 9)–12) Check outdoor unit and repair defect. 13) Check the detected temperature of outside temperature thermistor on LED display. 14)–16) Put the power off and check F5 is displayed when the power is put again. When F5 is displayed, refer to “Judgment and action” for F5. 17) Check linear expansion valve. Refer to "8-6. HOW TO CHECK THE PARTS". 18) Replace outdoor controller board. 19) Check the solenoid valve performance. 20) Check the high-pressure sensor. 21) Check the high-pressure sensor.

Check code	Abnormal point and detection method	Case	Judgment and action
U2 (1102)	**(1) High discharging temperature** Abnormal if compressor temperature thermistor (TH4) exceeds 125℃ or 110℃ continuously for 5 minutes. Abnormal if pressure detected by high pressure sensor and converted to saturation temperature exceeds 40℃ during defrosting and compressor temperature thermistor (TH4) exceeds 110℃.	① Overheated compressor operation caused by shortage of refrigerant ② Defective operation of stop valve ③ Defective thermistor ④ Defective outdoor controller board ⑤ Defective action of linear expansion valve	① Check intake superheat. Check leakage of refrigerant. Charge additional refrigerant. ② Check if stop valve is fully open. ③④ Turn the power off and check if U3 is displayed when the power is turned on again. When U3 is displayed, refer to “Judgement and action” for U3. ⑤ Check linear expansion valve. Refer to "8-6. HOW TO CHECK THE PARTS".
	(2) Refrigerant shortage abnormality ① When the conditions of below detecting mode Ⅰ or Ⅱ are satisfied (1st detection) during the compressor operation, the compressor stops and restarts operation in 3 minutes. <Detecting mode Ⅰ> When the below conditions are satisfied completely. 1. Compressor is operating in HEAT mode. 2. Discharge superheat is 70 ℃ or more. 3. Difference of outer temperature thermistor (TH7) and outdoor piping temp. thermistor (TH3) applies to the formula of (TH7-TH3)<5 ℃. 4. High-pressure sensor is below about 2.04MPa. <Detecting mode Ⅱ> When the below conditions are satisfied completely. 1. Compressor is operating. 2. When cooling, discharge superheat is 80℃ or more. When heating, discharge superheat is 90 ℃ or more. High pressure sensor is below about 2.32MPa. ② When the conditions of detecting mode Ⅰ and Ⅱ are satisfied again (2nd detection) within 30 minutes since the compressor has stopped and restarts operation in 3 minutes. ③ When the conditions of detecting mode Ⅰ and Ⅱ are satisfied again (3rd detection) within 30 minutes since the compressor has stopped, it stops abnormality. in this time, <U2> is displayed. ④ When the conditions of detecting mode Ⅰand Ⅱ are satisfied again after 30 minutes since the compressor has stopped (1st time), it becomes the 1st detection and same performance as above ①. ⑤ It is being delay for abnormal stop during 30 minutes since the compressor has stopped. In this time, check delay code <U2> will be displayed.	① Gas leakage, Gas shortage ② When heating operation, scant refrigerant operation (When heating, airflow or thermo OFF are mixed-operation, it cause a refrigerant shortage operation.) ③ Ball valve performance failure (Not fully opened.) ④ Error detection of discharge super heat 1) High-pressure sensor defective 2) Discharge temperature thermistor defective 3) Thermistor input circuit defective and high-pressure sensor defective in multi controller board ⑤ Error detection of TH7/TH3 1) Thermistor defective 2) Thermistor input circuit defective in multi controller board	① Check the refrigerant amount. ② Check the operation condition and refrigerant amount. ③ Check the ball valve is fully opened. ④ 1) Check the ball valve is fully opened. 2) Check the resistance of discharge temperature thermistor. 3) According to “Monitoring function for outdoor unit”, set the SW2 and check the high-pressure sensor level. According to “Monitoring function for outdoor unit”, set the SW2 and check the discharge temp. thermistor level. When the high-pressure sensor and discharge temp. thermistor are normal, if the above mentioned detecting pressure level and temp. are big different from the actual pressure and temp., replace the multi controller board. ⑤ 1) Check the resistance of thermistor. 2) According to “Monitoring function for outdoor unit”, set the SW2 and check the outdoor pipe temp. thermistor level. 3) According to “Monitoring function for outdoor unit”, set the SW2 and check the outer temp. thermistor level.
U3 (5104)	**Open/short circuit of compressor temperature thermistor (TH4)** Abnormal if open (3 ℃ or less) or short (217 ℃ or more) is detected during compressor operation. (Detection is inoperative for 10 minutes of compressor starting process and for 10 minutes after and during defrosting.)	① Disconnection or contact failure of connector (TH4) on the outdoor controller circuit board ② Defective thermistor ③ Defective outdoor controller circuit board	① Check connection of connector (TH4) on the outdoor controller circuit board. Check breaking of the lead wire for thermistor (TH4). Refer to "8-6. HOW TO CHECK THE PARTS". ② Check resistance value of thermistor (TH4) or temperature by microprocessor. (Thermistor/TH4: Refer to "8-6. HOW TO CHECK THE PARTS".) (SW2 on A-Control Service Tool: Refer to "8-8. FUNCTION OF SWITCHES, CONNECTORS AND JUMPERS") ③ Replace outdoor controller board.

<table>
<tr><th>Check code</th><th>Abnormal point and detection method</th><th>Case</th><th>Judgment and action</th></tr>
<tr><td>U4
(TH3:5105)
(TH7:5106)
(TH8:5110)
(63HS:5201)
(TH-A~E
:5131)</td><td>(1) Open/short circuit in the outdoor unit thermistors (TH3, TH7, and TH8) and branch box's thermistors (TH-A~E)
Abnormal if open or short circuit is detected while the compressor is operating.
Open detection of thermistors TH3 is inoperative for 10 seconds to 10 minutes after compressor starting and 10 minutes after and during defrosting.
Note:
Check which unit has abnormality in its thermistor by switching the mode of SW2.(Refer to "8-8. FUNCTION OF SWITCHES, CONNECTORS AND JUMPERS")
Open/short circuit in the branch box thermistor. (TH-A–TH-E)
<table><tr><th colspan="2">Thermistors</th><th rowspan="2">Open detection</th><th rowspan="2">Short detection</th></tr><tr><th>Symbol</th><th>Name</th></tr><tr><td>TH3</td><td>Thermistor <Outdoor pipe></td><td>– 40℃ or below</td><td>90℃ or above</td></tr><tr><td>TH7</td><td>Thermistor <Outdoor></td><td>– 40℃ or below</td><td>90℃ or above</td></tr><tr><td>TH8</td><td>Thermistor <Heatsink></td><td>– 27℃ or below</td><td>102℃ or above</td></tr><tr><td colspan="4">Branch box unit</td></tr><tr><td>TH-A~E
(Room A-E)</td><td>Thermistor
(Gas pipe temperature detection)</td><td>– 40℃ or below</td><td>90℃ or above</td></tr></table></td><td>②Defective thermistor
③Outdoor controller circuit board is defective.</td><td>①Check the connector's contact and the electric wires of thermistor.
②Check the resistance value of thermistors or the temperatures by referring to the section of "Monitoring function for outdoor unit". (Convert modes by SW2.)
③Replace the whole outdoor controller board.</td></tr>
<tr><td></td><td>(2) High-Pressure sensor (63HS) abnormality
① When detected pressure in high-pressure sensor is 1MPa or less during the operation, the compressor stops and restarts operation in 3 minutes.
② When the detected pressure is 1MPa or less at just before of restarting, the compressor stops abnormally. In this time, <U4> is displayed.
③ For 3 minutes after the compressor stops, the unit delays to abnormal stop. Then, the outdoor unit address No. and check delay code <U4> blinks alternately on the 7 SEG digital display.
④ For 3 minutes after starting compressor, for defrosting or for 3 minutes after recovery from defrosting, abnormality is not determined as abnormality.</td><td>① High-pressure sensor failure
② Internal pressure decrease by gas leakage
③ Connector contact failure disconnection
④ Controller board input circuit failure</td><td>① Check the high-pressure sensor.
② Check the internal pressure.
③ Check the high-pressure sensor.
④ Check the controller board</td></tr>
<tr><td>U5
(4230)</td><td>Abnormal temperature of heatsink
Abnormal if heatsink thermistor (TH8) detects temperature indicated 85℃</td><td>① The outdoor fan motor is locked.
② Failure of outdoor fan motor
③ Air flow path is clogged.
④ Rise of ambient temperature
⑤ Defective thermistor
⑥ Defective input circuit of outdoor power circuit board
⑦ Failure of outdoor fan drive circuit</td><td>①② Check outdoor fan.
③ Check air flow path for cooling.
④ Check if there is something which causes temperature rise around outdoor unit. (Upper limit of ambient temperature is 46℃.) Turn off power, and on again to check if U5 is displayed within 30 minutes. If U4 is displayed instead of U5, follow the action to be taken for U4.
⑤ Check resistance value of thermistor (TH8) or temperature by microprocessor. (Thermistor/TH8: Refer to "8-6. HOW TO CHECK THE PARTS".) (SW2 on A-Control Service Tool: Refer to "8-8. FUNCTION OF SWITCHES, CONNECTORS AND JUMPERS".)
⑥ Replace outdoor power circuit board.
⑦ Replace outdoor controller circuit board.</td></tr>
<tr><td>U6
(4250)</td><td>Abnormality of power module
Check abnormality by driving power module in case overcurrent is detected.
(UF or UP error condition)</td><td>① Outdoor stop valve is closed.
② Decrease of power supply voltage
③ Looseness, disconnection or converse of compressor wiring connection
④ Defective compressor
⑤ Defective outdoor power circuit board</td><td>① Open stop valve.
② Check facility of power supply.
③ Correct the wiring (U·V·W phase) to compressor. Refer to "8-7. TEST POINT DIAGRAM"
④ Check compressor referring to "8-6. HOW TO CHECK THE PARTS".
⑤ Replace outdoor power circuit board.</td></tr>
</table>

Check code	Abnormal point and detection method	Case	Judgment and action
U7 (1520)	**(1) Too low superheat due to low discharge temperature** Abnormal if discharge superheat is continuously detected -15℃ or less even though linear expansion valve has minimum open pulse after compressor starts operating for 10 minutes.	① Disconnection or loose connection of compressor temperature thermistor. (TH4) ② Defective holder of discharge temperature thermistor	①② Check the installation conditions of compressor temperature thermistor (TH4).
	(2) Erroneous connection of refrigerant pipes or the connecting wires Consider the stopping indoor unit abnormal if condenser/evaporator temperature thermistor (TH5 or RT12) detects -5℃ or below continuously for 5 minutes during a compressor's operation in cooling mode.	① Failure in piping/wiring ② Pipe (liquid) is clogged or crushed.	① Check piping/wiring between branch box and indoor unit. Refer to "Test run (Using remote controller)". ② Check the pipe for refrigerant and change the wrong parts.
U8 (4400)	**Outdoor fan motor** The outdoor fan motor is considered to be abnormal if the rotational frequency of fan motor is abnormal when detected during operation. Fan motor rotational frequency is abnormal if; • 100 rpm or below detected continuously for 15 seconds at 26℃ or more outside air temperature • 50 rpm or below or 1500 rpm or more detected continuously for 1 minute.	① Failure in the operation of the DC fan motor ② Failure in the outdoor circuit controller board	① Check or replace the DC fan motor. ② Check the voltage of the outdoor circuit controller board during operation. ③ Replace the outdoor circuit controller board. (when the failure is still indicated even after performing the remedy ① above.)
U9 (4220)	Detailed codes	To find out the details about U9 error, turn ON SW2-1, 2-2, 2-3, 2-4, 2-5 and 2-6 when U9 error occurs. Refer to "8-8. FUNCTION OF SWITCHES, CONNECTORS AND JUMPERS".	
	01	**Overvoltage error** • Increase in DC bus voltage to; V model: 400V Y model: 760V	① Abnormal increase in power source voltage ② Disconnection of compressor wiring ③ Defective outdoor power circuit board ④ Compressor has a ground fault.	① Check the field facility for the power supply. ② Correct the wiring (U·V·W phase) to compressor. Refer to "8-7. Outdoor power circuit board" . ③ Replace outdoor power circuit board. ④ Check compressor for electrical insulation. Replace compressor.
	02	**Undervoltage error** • Instantaneous decrease in DC bus voltage to; V model: 200V Y model: 350V	① Decrease in power source voltage, instantaneous stop. ② Disconnection or loose connection of CN52C on the outdoor power circuit board/ controller circuit board (V model) ③ Defective converter drive circuit in outdoor power circuit board (V model) ④ Defective 52C drive circuit in outdoor power circuit board ⑤ Defective outdoor converter circuit board (Y model) ⑥ Disconnection or loose connection of rush current protect resistor RS (Y model) ⑦ Defective rush current protect resistor RS (Y model) ⑧ Disconnection or loose connection of main smoothing capacitor CB (V model) ⑨ Disconnection or loose connection of CN2 on the outdoor power circuit board/ controller circuit board (V model) ⑩ Power circuit failure on DC supply for 18V DC output on outdoor controller circuit board (V model)	① Check the field facility for the power supply. ② Check CN52C wiring. (V model) ③ Replace outdoor power circuit board. (V model) ④ Replace outdoor power circuit board. ⑤ Replace outdoor converter circuit board. (Y model) ⑥ Check RS wiring. (Y model) ⑦ Replace RS. (Y model) ⑧ Check CB wiring. (V model) ⑨ Check CN2 wiring. (V model) ⑩ Replace outdoor controller circuit board. (V model)

Check code	Abnormal point and detection method		Case	Judgment and action
U9 (4220)	Detailed codes 04	**Input current sensor error/ L1-phase open error** • Decrease in input current through outdoor unit to 0.1A only if operation frequency is more than or equal to 40Hz or compressor current is more than or equal to 6A.	① L1-phase open (Y model) ② Disconnection or loose connection between TB1 and outdoor noise filter circuit board (Y model) ③ Disconnection or loose connection of CN5 on the outdoor power circuit board/ CNCT on the outdoor noise filter board ④ Defective ACCT (AC current trans) on the outdoor noise filter circuit board (Y model) ⑤ Defective input current detection circuit in outdoor power circuit board ⑥ Defective outdoor controller circuit board	① Check the field facility for the power supply. (Y model) ② Check the wiring between TB1 and outdoor noise filter circuit board. (Y model) ③ Check CN5/CNCT wiring. (Y model) ④ Replace outdoor noise filter circuit board. (Y model) ⑤ Replace outdoor power circuit board. ⑥ Replace outdoor controller circuit board.
	08	**Abnormal power synchronous signal** • No input of power synchronous signal to power circuit board • Power synchronous signal of 44 Hz or less, or 65 Hz or more is detected on power circuit board.	① Distortion of power source voltage, noise superimposition. ② Disconnection or loose connection of earth wiring ③ Disconnection or loose connection of CN2 on the outdoor power circuit board /controller circuit board ④ Defective power synchronous signal circuit in outdoor controller circuit board ⑤ Defective power synchronous signal circuit in outdoor power circuit board	① Check the field facility for the power supply. ② Check earth wiring. ③ Check CN2 wiring. ④ Replace outdoor controller circuit board. ⑤ Replace outdoor power circuit board.
	20	**PFC/IGBT error (Undervoltage)** • When Compressor is running, DC bus voltage stays at 310V or lower for consecutive 10 seconds (V model only)	① Incorrect switch settings on the outdoor controller circuit board for model select ② Defective outdoor power circuit board ③ Defective outdoor controller circuit board	① Correction of a model select ② Replace outdoor power circuit board. ③ Replace outdoor controller circuit board.
UF (4100)	**Compressor overcurrent interruption (When compressor locked)** Abnormal if overcurrent of DC bus or compressor is detected within 30 seconds after compressor starts operating.		① Stop valve is closed. ② Decrease of power supply voltage ③ Looseness, disconnection or converse of compressor wiring connection ④ Defective compressor ⑤ Defective outdoor power board	① Open stop valve. ② Check facility of power supply. ③ Correct the wiring (U·V·W phase) to compressor. Refer to "8-7. TEST POINT DIAGRAM". ④ Check compressor. Refer to "8-6. HOW TO CHECK THE PARTS". ⑤ Replace outdoor power circuit board.
UH (5300)	**Current sensor error** Abnormal if current sensor detects - 1.5A to 1.5A during compressor operation. (This error is ignored in case of test run mode.)		① Disconnection of compressor wiring ② Defective circuit of current sensor on outdoor power circuit board	① Correct the wiring (U·V·W phase) to compressor. Refer to "8-7. TEST POINT DIAGRAM". ② Replace outdoor power circuit board.
	Abnormal if input current exceeds 38 A or 34A continuously 10 seconds. (Current sensor on noise filter board detects input current)		① Decrease of power supply voltage	① Check the facility of power supply.
UL (1300)	**Low pressure (63L operated)** Abnormal if 63L is operated (under-0.03MPa) during compressor operation. 63L: Low-pressure switch		① Stop valve of outdoor unit is closed during operation. ② Disconnection or loose connection of connector (63L) on outdoor controller board ③ Disconnection or loose connection of 63L ④ Defective outdoor controller board ⑤ Leakage or shortage of refrigerant ⑥ Malfunction of linear expansion valve	① Check stop valve. ②–④ Turn the power off and on again to check if F3 is displayed on restarting. If F3 is displayed, follow the F3 processing direction. ⑤ Correct to proper amount of refrigerant. ⑥ Check linear expansion valve. Refer to "8-6. HOW TO CHECK THE PARTS".

Check code	Abnormal point and detection method	Case	Judgment and action
UP (4210)	**Compressor overcurrent interruption** Abnormal if overcurrent DC bus or compressor is detected after compressor starts operating for 30 seconds.	① Stop valve of outdoor unit is closed. ② Decrease of power supply voltage ③ Looseness, disconnection or converse of compressor wiring connection ④ Defective fan of indoor/outdoor units ⑤ Short cycle of indoor/outdoor units ⑥ Defective input circuit of outdoor controller board ⑦ Defective compressor	① Open stop valve. ② Check facility of power supply. ③ Correct the wiring (U·V·W phase) to compressor. Refer to "8-7. TEST POINT DIAGRAM". ④ Check indoor/outdoor fan. ⑤ Solve short cycle. ⑥ Replace outdoor controller circuit board. ⑦ Check compressor. Refer to "8-6. HOW TO CHECK THE PARTS". Note: Before the replacement of the outdoor controller circuit board, disconnect the wiring for compressor from the outdoor power circuit board and check the output voltage among phases, U, V, W, during test run. No defect on board if voltage among phases (U-V, V-W and W-U) is same. Make sure to perform the voltage check with same performing frequency.
E0 (No display)	**Remote controller communication error (Signal receiving error)** (1) Abnormal if any signal from IC of refrigerant address "0" could not be normally received for 3 minutes. (2) Abnormal if sub remote controller could not receive any signal for 2 minutes.	① Defective communication circuit of remote controller ② Defective communication circuit of indoor controller board of refrigerant address "0" ③ Noise has entered into transmission line of remote controller. ④ All remote controllers are set as "sub" remote controller. In this case, E4 is displayed at outdoor LED, and E0 is displayed at remote controller.	①–③ Diagnose remote controller. Take actions as follows according to diagnosis result. a) When "RC OK" is displayed, remote controllers have no problem. Turn the power off, and on again to check. If, "PLEASE WAIT" or "H0" is displayed for 4 minutes or more, replace indoor controller board. b) When "RC NG" is displayed, replace remote controller. c) When "RC E3" or "ERC 00-66" is displayed, noise may be causing abnormality. ④ Set a remote controller to main, and the other to sub. Note: The descriptions above, ①-③, are for E0 and E3.
E3 (No display)	**Remote controller communication error (Transmitting error)** (1) Abnormal if sub remote controller could not find blank of transmission path for 6 seconds. (2) Abnormal if remote controller could not finish transmitting 30 times continuously.	① Defective communication circuit of remote controller ② Noise has entered into transmission line of remote controller. ③ Two remote controllers are set as "main." (In case of 2 remote controllers)	
E8 (6840)	**Indoor - branch box/branch box - outdoor unit communication error (Signal receiving error) (Branch box/outdoor unit)** Abnormal if branch box/outdoor controller circuit board could not receive anything normally for 3 minutes.	① Contact failure of indoor/outdoor unit connecting wire ② Defective communication circuit of branch box/outdoor controller circuit board ③ Defective communication circuit of indoor/branch box controller board ④ Noise has entered into indoor–branch box/branch box–outdoor unit connecting wire.	① Check disconnection or looseness of indoor–branch box/branch box–outdoor unit connecting wire of indoor or branch box or outdoor units. ②–④ Turn the power off, and on again to check. Replace indoor controller board or branch controller board or outdoor controller circuit board if abnormality is displayed again.
E9 (6841)	**Indoor - branch box/branch box - outdoor unit communication error (Transmitting error) (Branch box/outdoor unit)** (1) Abnormal if "0" receiving is detected 30 times continuously though branch box/outdoor controller circuit board has transmitted "1". (2) Abnormal if branch box/outdoor controller circuit board could not find blank of transmission path for 3 minutes.	① Indoor–branch box/branch box–outdoor unit connecting wire has contact failure. ② Defective communication circuit of outdoor controller circuit board ③ Noise has entered power supply. ④ Noise has entered Indoor–branch box/branch box–outdoor unit connecting wire.	① Check disconnection or looseness of indoor–branch box/branch box–outdoor unit connect-ing wire. ②–④ Turn the power off, and on again to check. Replace outdoor controller circuit board if abnormality is displayed again.
EF (6607 or 6608)	**Non defined check code** This code is displayed when non defined check code is received.	① Noise has entered transmission wire of remote controller. ② Noise has entered Indoor–branch box/branch box–outdoor unit connecting wire. ③ Model name of remote controller is PAR-S25A.	①② Turn the power off, and on again to check. Replace indoor controller board or branch controller board or outdoor controller circuit board if abnormality is displayed again. ③ Replace remote controller with MA remote controller.

Check code	Abnormal point and detection method	Case	Judgment and action
Ed (0403)	**Serial communication error** Abnormal if serial communication between outdoor controller circuit board and outdoor power circuit board is defective.	① Breaking of wire or contact failure of connector CN2 between the outdoor controller circuit board and the outdoor power circuit board ② Breaking of wire or contact failure of connector CN4 between the outdoor controller circuit board and the outdoor power circuit board ③ Defective communication circuit of outdoor power circuit board ④ Defective communication circuit of outdoor controller circuit board for outdoor power circuit board	①② Check connection of each connector CN2 and CN4 between the outdoor controller circuit board and the outdoor power circuit board. ③ Replace outdoor power circuit board. ④ Replace outdoor controller circuit board.
PA (2520)	**Forced compressor stop.** (Overlap malfunction of drain pump in indoor unit and linear expansion valve in branch box.) When condition of the outdoor unit is forcefully stopped, which means the drain sensor detects continuously to go under water 5 times, and also detects "[liquid pipe temperature - suction temperature] ≦ – 10deg" for 30 minutes continuously, the indoor unit and indoor units in same refrigerant system which operates in cooling, heating or dry mode stops abnormally. Also, the outdoor unit which is connected to that indoor unit with refrigerant system stops abnormally (compressor is suspended to operate). In this time, <PA> is displayed.	① Drain pump trouble ② Drain defective · Drain pump clogging · Drain pipe clogging ③ Open circuit of drain sensor side heater ④ Contact failure of drain sensor connector ⑤ Dew condensation on drain sensor · Drain water descends along lead wire. · Drain water waving due to filter clogging ⑥ Indoor controller board defective · Drain pump drive circuit failure · Drain heater output circuit failure ⑦ Both of above mentioned ①–⑥ and the linear expansion valve full closed failure happens synchronistically.	① Check the drain pump. ② Please confirm whether water can be drained. ③ Confirm the resistance of the drain sensor side heater. ④ Check the connector contact failure. ⑤ Check the drain sensor leadwire mounted. Check the filter clogging. ⑥ If the above mentioned checkpoints has any problem, replace the indoor controller board. ⑦ Check whether the indoor linear expansion valve leaks or not.

8-4. TROUBLESHOOTING OF PROBLEMS

Phenomena	Factor	Countermeasure
1. Remote controller display operates normally and the unit performs cooling operation, however, the capacity cannot be fully obtained. (The air does not cool well.)	① Refrigerant shortage	① If refrigerant leaks, discharging temperature rises and LEV opening increases. Inspect leakage by checking the temperature and opening. Check pipe connections for gas leakage.
	② Filter clogging	② Open intake grille and check the filter. Clean the filter by removing dirt or dust on it.
	③ Heat exchanger clogging	③ If the filter is clogged, indoor pipe temperature rises and discharging pressure increases. Check if heat exchanger is clogged by inspecting discharging pressure. Clean the heat exchanger.
	④ Air duct short cycle	④ Remove the blockage.
2. Remote controller display operates normally and the unit performs heating operation, however, the capacity cannot be fully obtained.	① Linear expansion valve fault Opening cannot be adjusted well due to linear expansion valve fault.	① Discharging temperature and indoor heat exchanger temperature does not rise. Inspect the failure by checking discharging pressure. Replace linear expansion valve.
	② Refrigerant shortage	② If refrigerant leaks, discharging temperature rises and LEV opening increases. Inspect leakage by checking the temperature and opening. Check pipe connections for gas leakage.
	③ Lack of insulation for refrigerant piping	③ Check the insulation.
	④ Filter clogging	④ Open intake grille and check the filter. Clean the filter by removing dirt or dust on it.
	⑤ Heat exchanger clogging	⑤ If the filter is clogged, indoor pipe temperature rises and discharging pressure increases. Check if heat exchanger is clogged by inspecting discharging pressure. Clean the heat exchanger.
	⑥ Air duct short cycle	⑥ Remove the blockage.
	⑦ Bypass circuit of outdoor unit fault	⑦ Check refrigerant system during operation.
3.① For 3 minutes after temperature adjuster turns off, the compressor will not start operating even if temperature adjuster is turned on. ② For 3 minutes after temperature adjuster turns on, the compressor will not stop operating even if temperature adjuster is turned off. (Compressor stops operating immediately when turning off by the remote controller.)	①② Normal operation (For protection of compressor)	①② Normal operation

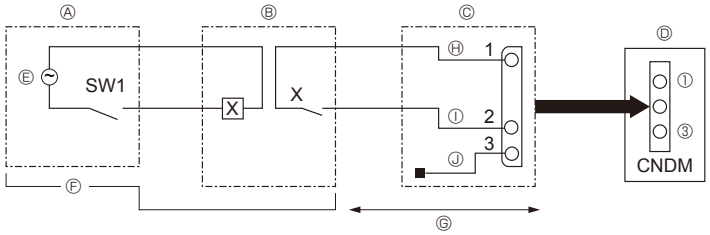
8-5. SPECIAL FUNCTIONS

8-5-1. Low noise mode (on-site modification) (Fig. 8-1)

By performing the following modification, operation noise of the outdoor unit can be reduced by about 3-4 dB.
The low noise mode will be activated when a commercially available timer or the contact input of an ON/OFF switch is added to the CNDM connector (optional parts) on the control board of the outdoor unit.

- The capacity may be insufficient according to the outdoor temperature and conditions, etc.

① Complete the circuit as shown when using the external input adapter (PAC-SC36NA). (Optional parts)



Ⓐ Remote control panel
Ⓑ Relay circuit
Ⓒ External input adapter (PAC-SC36NA)
Ⓓ Outdoor unit control board
Ⓔ Replay power supply
Ⓕ Procure locally
Ⓖ Max. 10m
Ⓗ Orange
Ⓘ Brown
Ⓙ Red

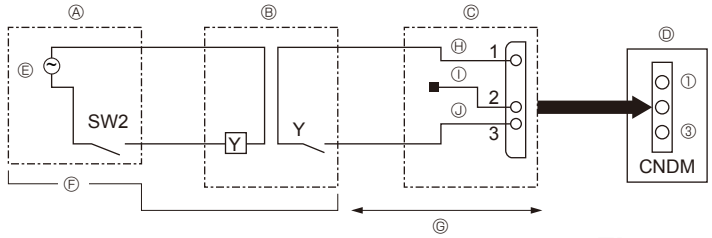
Fig. 8-1

8-5-2. Demand function (on-site modification) (Fig. 8-2)

- It is possible to reduce electricity consumption within a range from 0 to 100 % by performing the following on-site installation. The demand function can be enabled by adding a commercially available input contact point ON/OFF switch to the CNDM connector (the contact point demand input, optional parts).

① Incorporate the “Adapter for external input (PAC-SC36NA)” into the circuit as shown in the diagram below.
② By switching SW7-1 on the control circuit board for the outdoor unit, the following power consumption restrictions (compared to rated power) can be set.

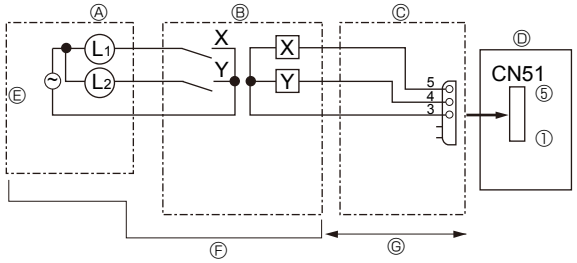
SW7-1	Power consumption when SW2 is on
OFF	0% (Forced compressor stop)
ON	50%



Ⓐ Remote control panel
Ⓑ Relay circuit
Ⓒ External input adapter (PAC-SC36NA)
Ⓓ Outdoor unit control board
Ⓔ Replay power supply
Ⓕ Procure locally
Ⓖ Max. 10m
Ⓗ Orange
Ⓘ Brown
Ⓙ Red

Fig. 8-2

8-5-3. Error and compressor operation monitoring function (CN51)

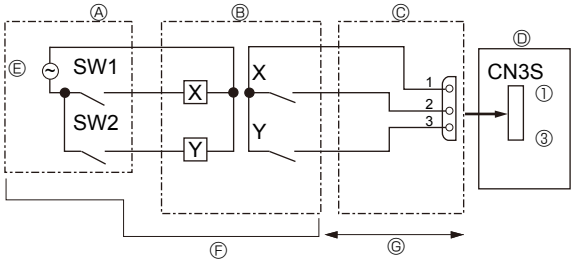


Ⓐ Distant control board
Ⓑ Relay circuit
Ⓒ External output adapter (PAC-SA88HA-E)
Ⓓ Outdoor unit control board
Ⓔ Lamp power supply
Ⓕ Procure locally
Ⓖ Max. 10m

L_1 : Error display lamp
L_2 : Compressor operation lamp
X, Y : Relay (Coil standard of 0.9W or less for DC 12V)
X, Y : Relay (DC1mA)

Fig. 8-3

8-5-4. Auto change over - Operation mode locking function by external signal (CN3S)



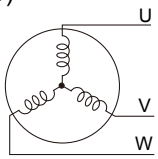
Ⓐ Remote control panel
Ⓑ Relay circuit
Ⓒ External input adapter (PAC-SC36NA)
Ⓓ Outdoor unit control board
Ⓔ Relay power supply
Ⓕ Procure locally
Ⓖ Max. 10m

	ON	OFF
SW1	Heating	Cooling
SW2	Validity of SW1	Invalidity of SW1

* The indoor unit, which is operating in the mode different from the one determined by external signal (CN3S), will be a state of standby.
* The setting becomes effective when the outdoor unit is under stop.
* The operation mode specified by test run will be prior to the mode of this function.

Fig. 8-4

8-6. HOW TO CHECK THE PARTS
MXZ-8B140VA MXZ-8B140YA MXZ-8B160VA MXZ-8B160YA

<table>
<tr><th>Parts name</th><th>Check points</th></tr>
<tr><td>Thermistor (TH3)
<Outdoor pipe>
Thermistor (TH4)
<Compressor>
Thermistor (TH7)
<Outdoor>
Thermistor (TH8)
<Heatsink></td><td>Disconnect the connector then measure the resistance with a tester.
(At the ambient temperature 10℃~30℃)
<table>
<tr><th></th><th>Normal</th><th>Abnormal</th></tr>
<tr><td>TH4</td><td>160kΩ ~ 410kΩ</td><td rowspan="3">Open or short</td></tr>
<tr><td>TH3
TH7</td><td>4.3kΩ ~ 9.6kΩ</td></tr>
<tr><td>TH8</td><td>39kΩ ~ 105kΩ</td></tr>
</table></td></tr>
<tr><td>Fan motor(MF1,MF2)</td><td>Refer to next page.</td></tr>
<tr><td>Solenoid valve coil
<Four-way valve>
(21S4)</td><td>Measure the resistance between the terminals with a tester.
(At the ambient temperature 20℃)
<table>
<tr><th>Normal</th><th>Abnormal</th></tr>
<tr><td>MXZ-8B140VA/160VA
MXZ-8B140YA/160YA</td><td rowspan="2">Open or short</td></tr>
<tr><td>1435 ± 150Ω</td></tr>
</table></td></tr>
<tr><td>Motor for compressor
(MC)
 
</td><td>Measure the resistance between the terminals with a tester.
(Winding temperature 20℃)
<table>
<tr><th colspan="2">Normal</th><th>Abnormal</th></tr>
<tr><td>MXZ-8B140VA/160VA</td><td>MXZ-8B140YA/160YA</td><td rowspan="2">Open or short</td></tr>
<tr><td>0.188Ω</td><td>0.302Ω</td></tr>
</table></td></tr>
<tr><td>Solenoid valve coil
<Bypass valve>
(SV1)</td><td>Measure the resistance between the terminals with a tester.
(At the ambient temperature 20℃)
<table>
<tr><th>Normal</th><th>Abnormal</th></tr>
<tr><td>1327 ± 10Ω</td><td>Open or short</td></tr>
</table></td></tr>
<tr><td>Solenoid valve coil
<Bypass valve>
(SV2)</td><td>Measure the resistance between the terminals with a tester.
(At the ambient temperature 20℃)
<table>
<tr><th>Normal</th><th>Abnormal</th></tr>
<tr><td>MXZ-8B140VA/160VA
MXZ-8B140YA/160YA</td><td rowspan="2">Open or short</td></tr>
<tr><td>1450 ± 150Ω</td></tr>
</table></td></tr>
</table>

Check method of DC fan motor (fan motor / outdoor controller circuit board)

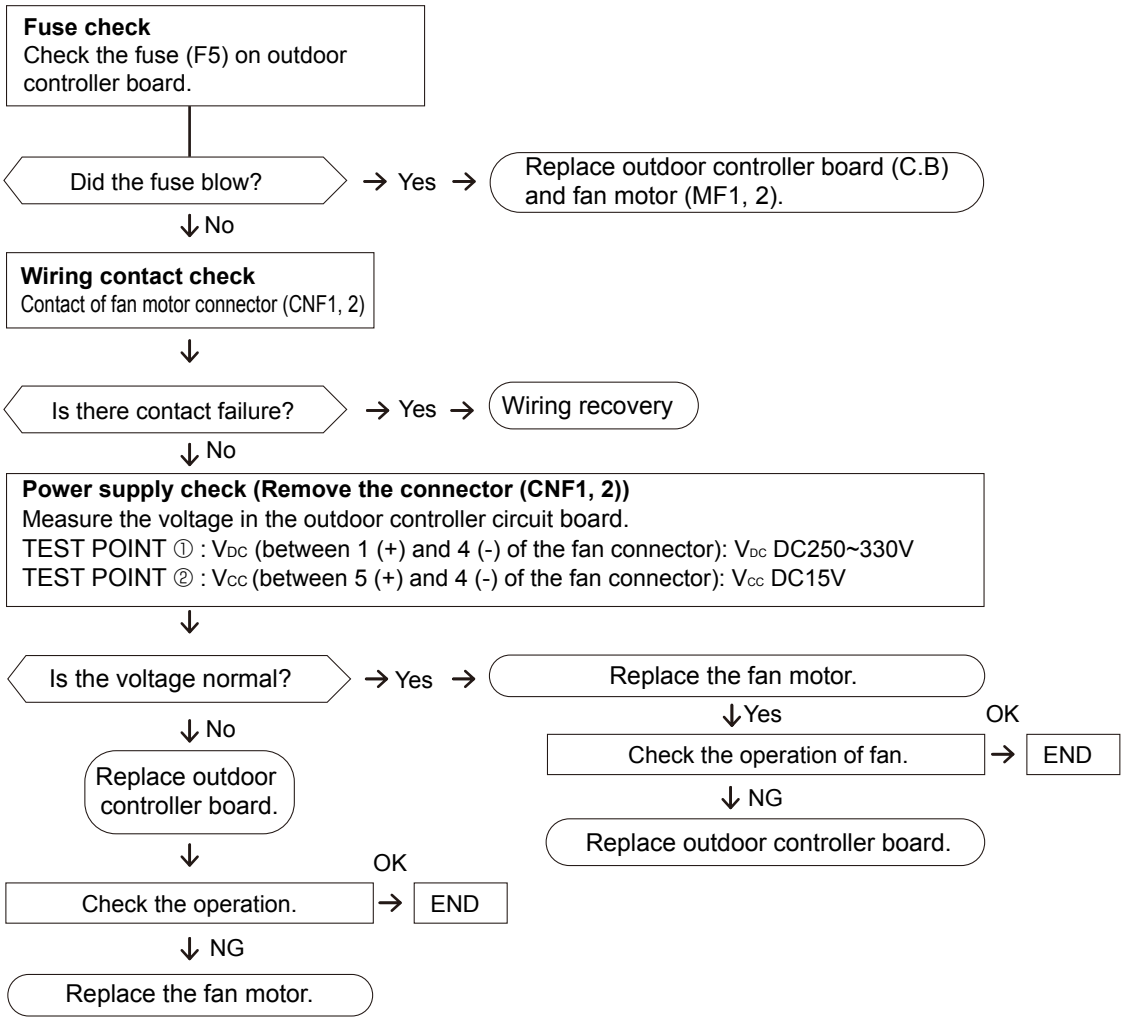
① Notes

· High voltage is applied to the connecter (CNF1, 2) for the fan motor. Pay attention to the service.

· Do not pull out the connector (CNF1, 2) for the motor with the power supply on.
(It causes trouble of the outdoor controller circuit board and fan motor.)

② Self check

Symptom : The outdoor fan cannot turn around.



<Thermistor feature chart>

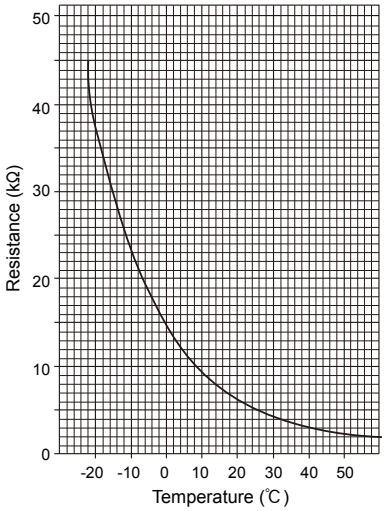
Low temperature thermistors

Pipe temperature thermistor <Liquid> (TH3)
Pipe temperature thermistor <Cond.> (TH6)
Outdoor temperature thermistor (TH7)
Gas pipe temperature thermistor (TH-A ~ TH-E)···· Branch box

Thermistor R0 = 15 kΩ ± 3 %
B constant = 3480 ± 2 %

$$R_t = 15\exp\{3480(\frac{1}{273+t} - \frac{1}{273})\}$$

0 ℃	15 kΩ	30 ℃	4.3 kΩ
10 ℃	9.6 kΩ	40 ℃	3.0 kΩ
20 ℃	6.3 kΩ		
25 ℃	5.4 kΩ		



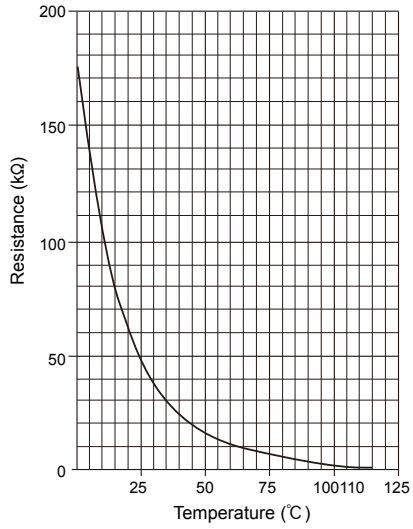
Medium temperature thermistor

Heatsink temperature thermistor (TH8)

Thermistor R50 = 17 kΩ ± 2%
B constant = 4170 ± 3%

$$R_t = 17\exp\{4170(\frac{1}{273+t} - \frac{1}{323})\}$$

0 ℃	180 kΩ
25 ℃	50 kΩ
50 ℃	17 kΩ
70 ℃	8 kΩ
90 ℃	4 kΩ



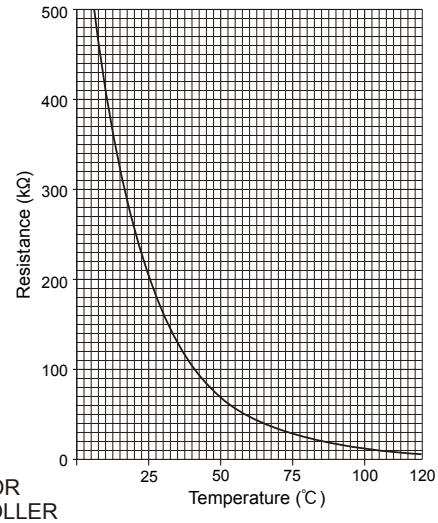
High temperature thermistor

Compressor temperature thermistor (TH4)

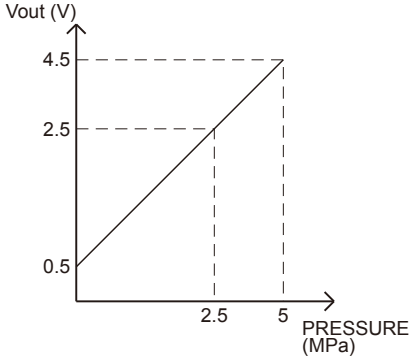
Thermistor R120 = 7.465 kΩ ± 2 %
B constant = 4057 ± 2%

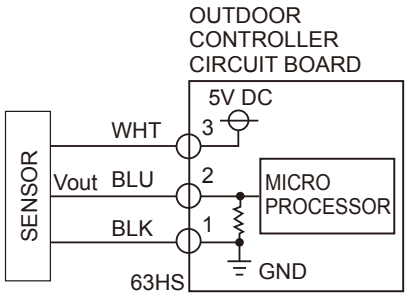
$$R_t = 7.465\exp\{4057(\frac{1}{273+t} - \frac{1}{393})\}$$

20 ℃	250 kΩ	70 ℃	34 kΩ
30 ℃	160 kΩ	80 ℃	24 kΩ
40 ℃	104 kΩ	90 ℃	17.5 kΩ
50 ℃	70 kΩ	100 ℃	13.0 kΩ
60 ℃	48 kΩ	110 ℃	9.8 kΩ



<HIGH PRESSURE SENSOR>





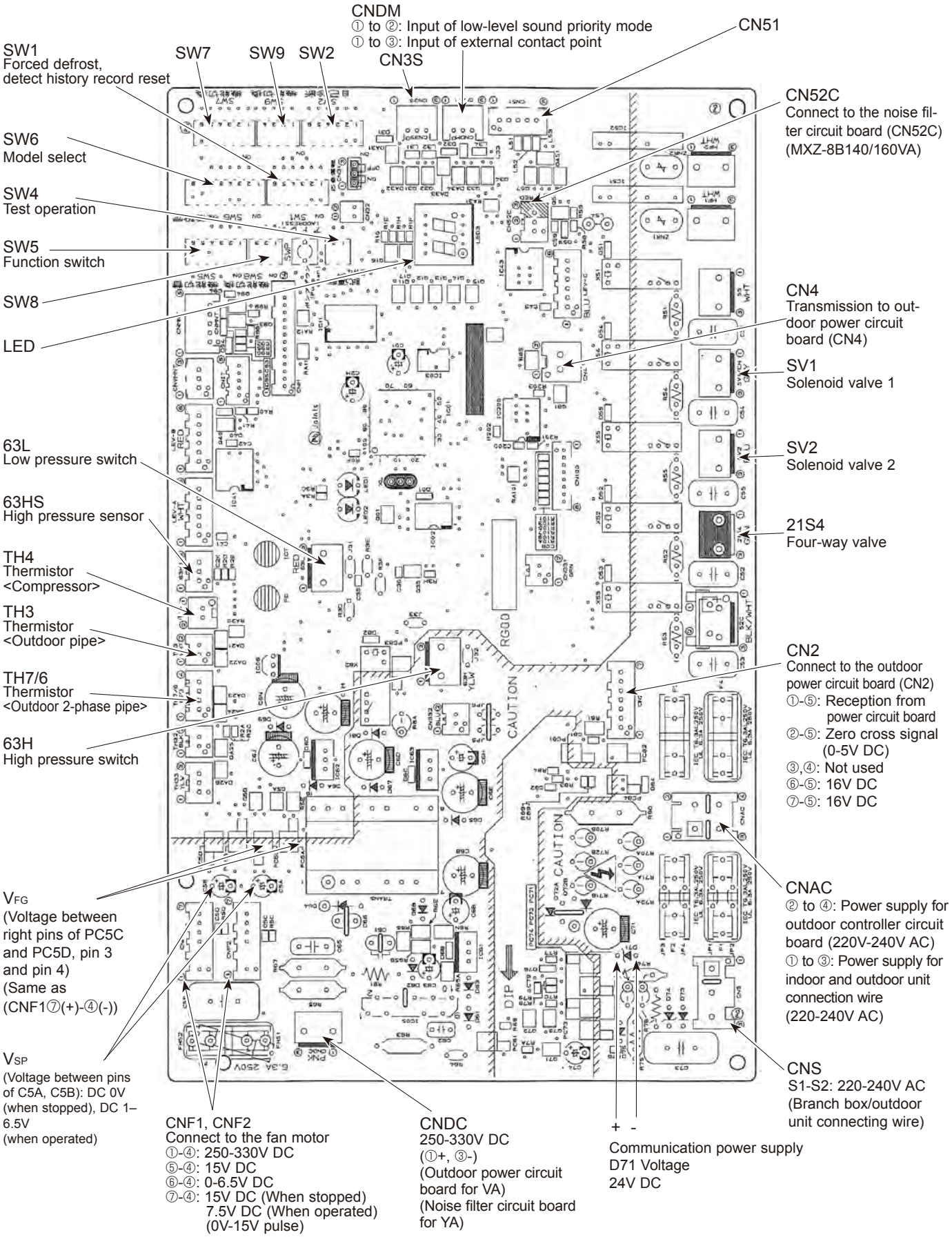
③-① : 5V (DC)
②-① : Output Vout (DC)

8-7. TEST POINT DIAGRAM

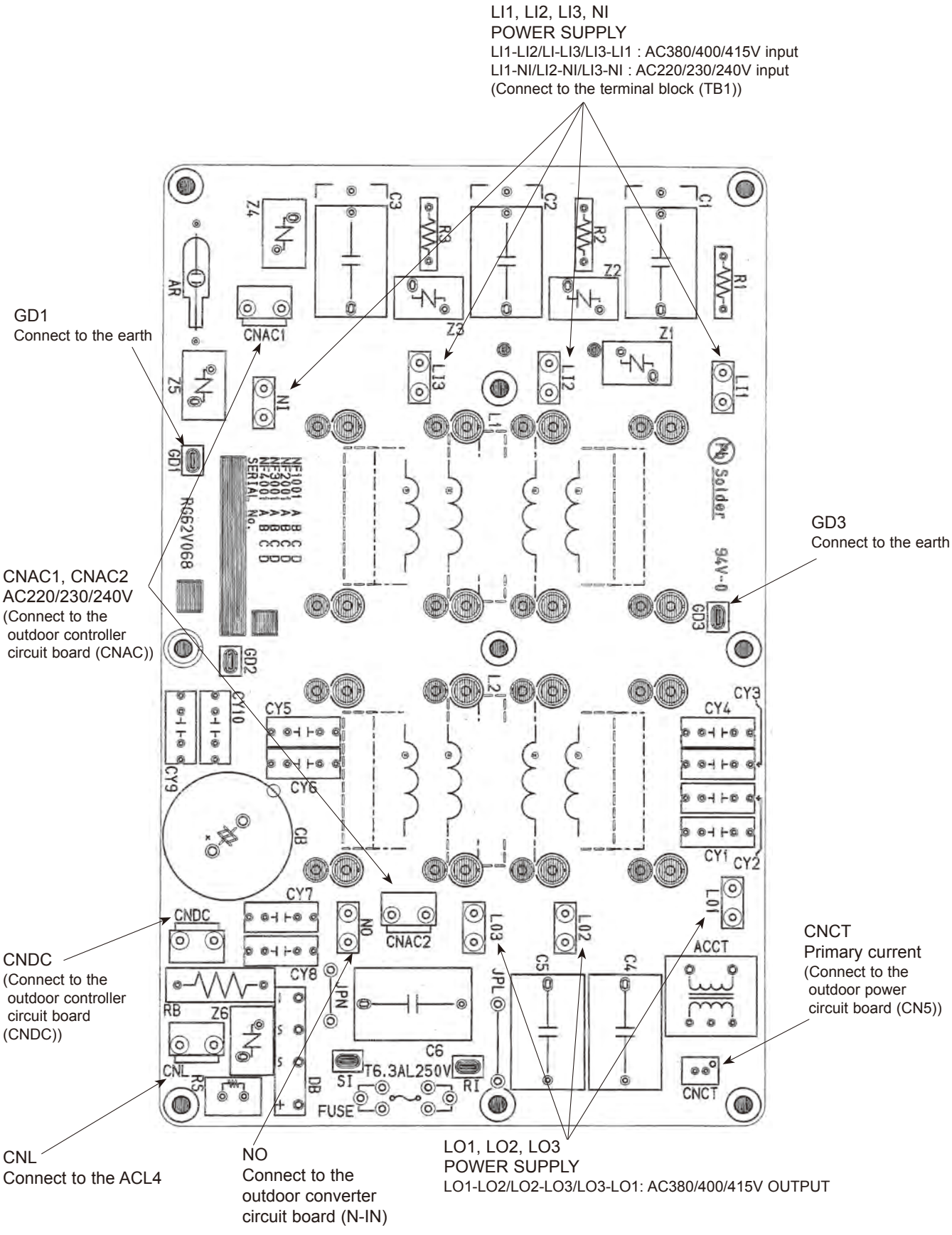
<CAUTION> TEST POINT ① is high voltage.

8-7-1. Outdoor controller circuit board

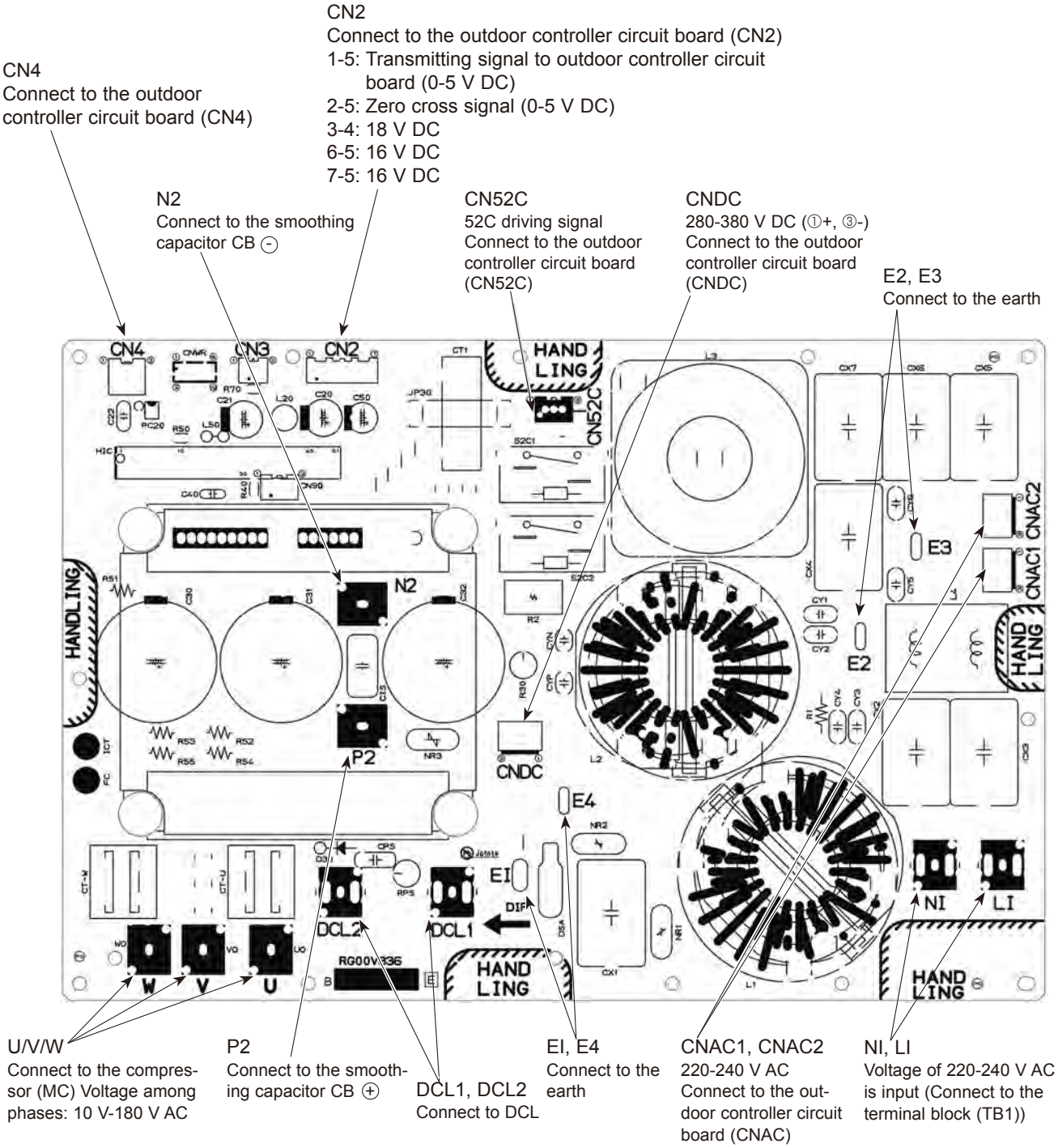
MXZ-8B140VA MXZ-8B140YA MXZ-8B160VA MXZ-8B160YA



8-7-2. Outdoor noise filter circuit board
MXZ-8B140YA
MXZ-8B160YA



8-7-3. Outdoor power circuit board
MXZ-8B140VA
MXZ-8B160VA



Outdoor power circuit board
MXZ-8B140YA
MXZ-8B160YA

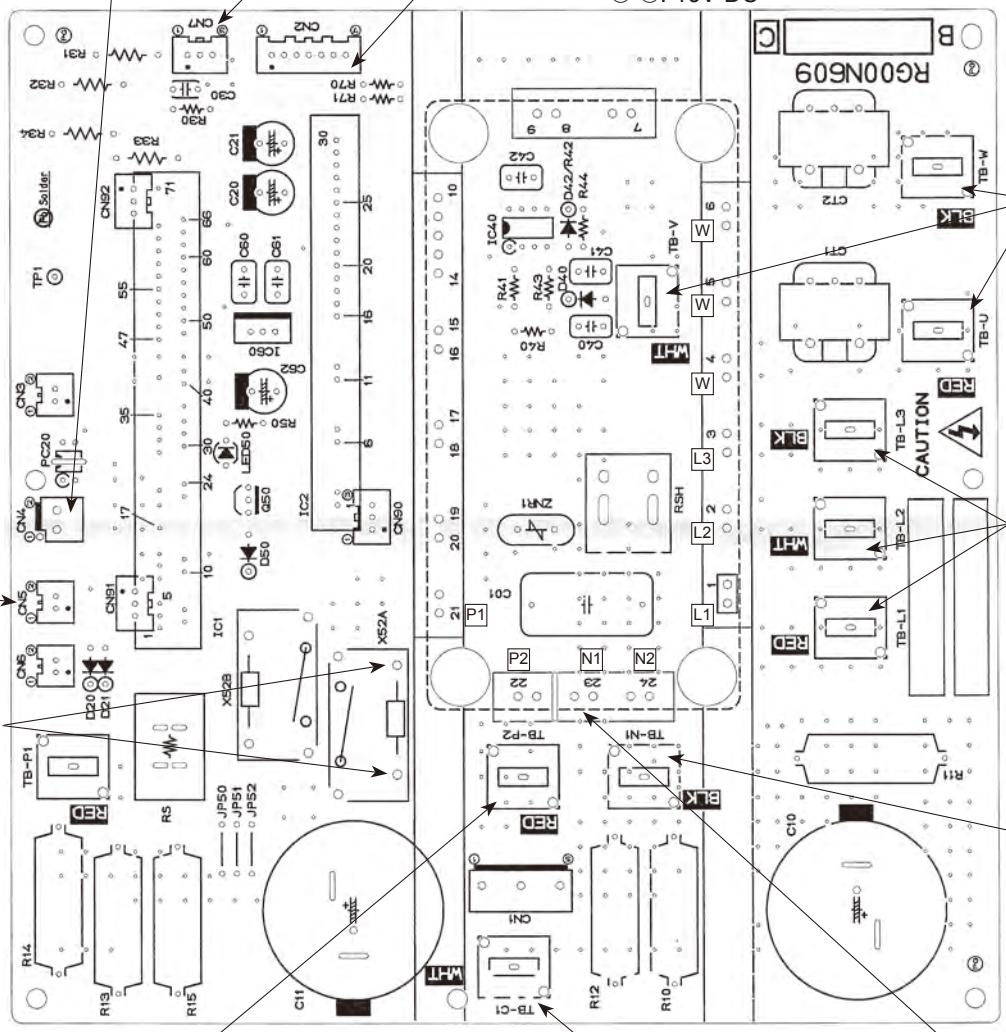
Brief Check of POWER MODULE
* Usually, they are in a state of being short-circuited if they are broken.
Measure the resistance in the following points (connectors, etc.).
If they are short-circuited, it means that they are broken.
1. Check of POWER MODULE
① Check of DIODE circuit
L1 - P1, L2 - P1, L3 - P1, L1 - N1, L2 - N1, L3 - N1
② Check of IGBT circuit
P2 - U, P2 - V, P2 - W, N2 - U, N2 - V, N2 - W
Note: The marks, L1, L2, L3, N1, N2, P1, P2, U, V and W shown in the diagram are not actually printed on the board.

CN5
Detection of primary current (Connect to the outdoor noise filter circuit board (CNCT))

CN4
Connect to the outdoor controller circuit board (CN4)

CN7
Connect to the outdoor converter circuit board (CN7)

CN2
Connect to the outdoor controller circuit board (CN2)
①-⑤: Power circuit board → Transmitting signal to the controller board (0-5V DC)
②-⑤: Zero cross signal (0-5V DC)
③-④: Not used [⑤ : ⊖ ①, ②, ⑥, ⑦ : ⊕]
⑥-⑤: 16V DC
⑦-⑤: 16V DC



TB-U, TB-V, TB-W
Connect to the compressor (MC)
Voltage among phases:
10V-400V AC

TB-L1, TB-L2, TB-L3
Connect to the outdoor converter circuit board (L1-OU, L2-OU, L3-OU) (140/160VA)
Connect to the outdoor noise filter circuit board (LO1, LO2, LO3) (140/160YA)
380V-415V AC

TAB connecter on X52A
Connect to the RS resistor

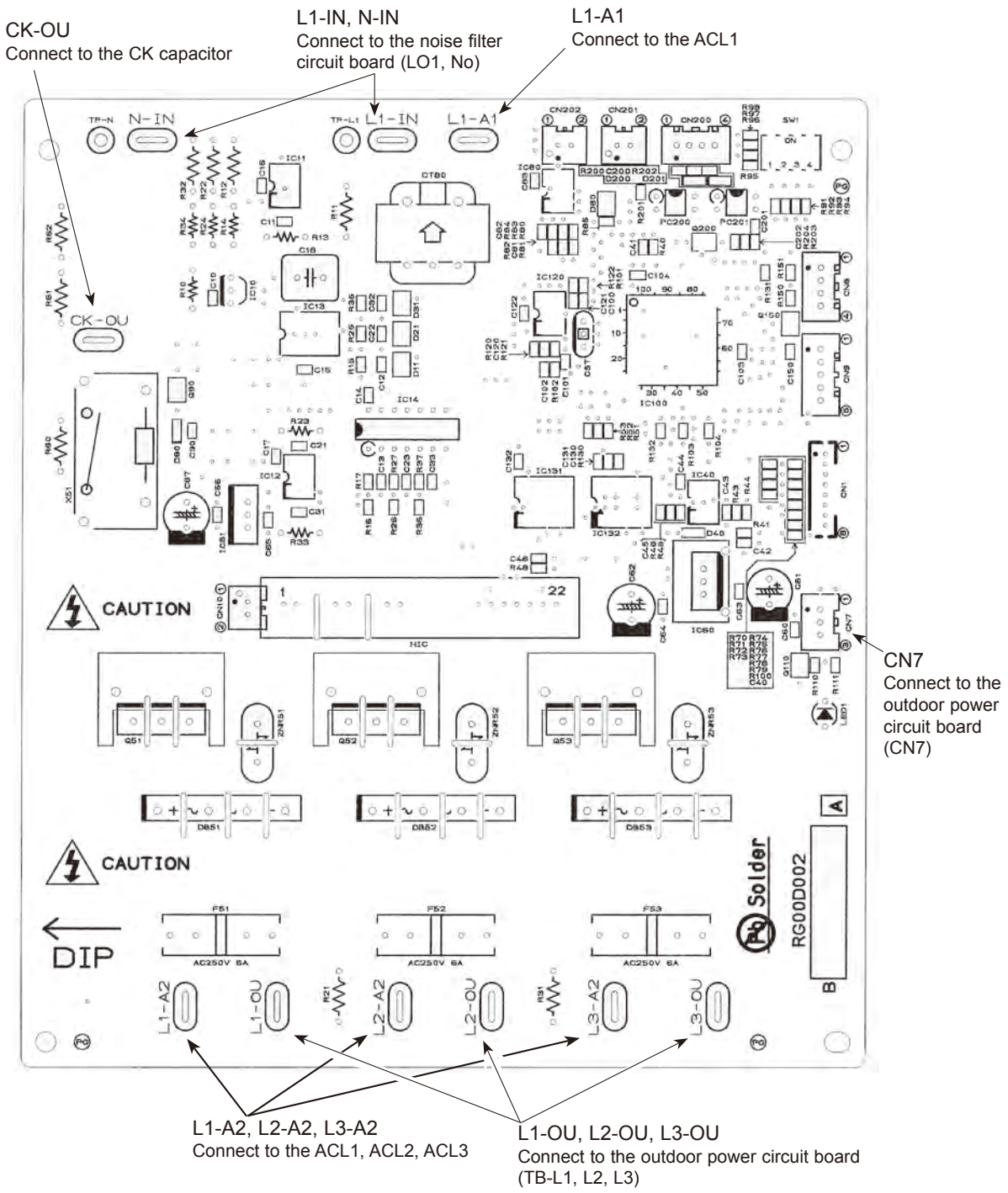
TB-N1
Connect to the smoothing capacitor CB2⊖, CK capacitor (CK capacitor only for 140/160VA)

TB-P2
Connect to the smoothing capacitor CB1⊕

TB-C1
Connect to the smoothing capacitor CB1⊖, CB2⊕

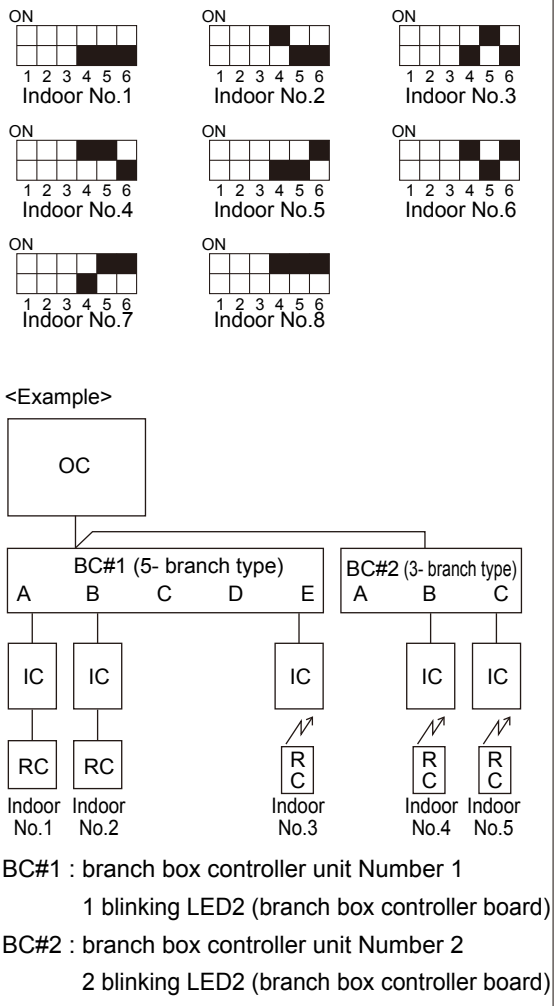
POWER MODULE

8-7-4. Outdoor converter circuit board
MXZ-8B140YA
MXZ-8B160YA



8-8. FUNCTION OF SWITCHES, CONNECTORS AND JUMPERS

(1) Function of switches **The black square (■) indicators a switch position.**

<table>
<tr><th rowspan="2">Type of Switch</th><th rowspan="2">Switch</th><th rowspan="2">No.</th><th rowspan="2">Function</th><th colspan="2">Action by the switch operation</th><th rowspan="2">Effective timing</th></tr>
<tr><th>ON</th><th>OFF</th></tr>
<tr><td rowspan="8">Dip switch</td><td rowspan="6">SW1</td><td>1</td><td>Forced defrost</td><td>Start</td><td>Normal</td><td>When compressor is operating in heating operation. *</td></tr>
<tr><td>2</td><td>Abnormal history clear</td><td>Clear</td><td>Normal</td><td>off or operating</td></tr>
<tr><td>3</td><td>No function</td><td>—</td><td>—</td><td>—</td></tr>
<tr><td>4</td><td rowspan="3">Self-diagnosis
(Indoor unit selection)</td><td colspan="2" rowspan="3"> 

BC#1 : branch box controller unit Number 1
1 blinking LED2 (branch box controller board)
BC#2 : branch box controller unit Number 2
2 blinking LED2 (branch box controller board)</td><td rowspan="3">Indicating a particular self-diagnosis</td></tr>
<tr><td>5</td></tr>
<tr><td>6</td></tr>
<tr><td rowspan="2">SW4</td><td>1</td><td>Test run</td><td>Operating</td><td>OFF</td><td rowspan="2">Under suspension</td></tr>
<tr><td>2</td><td>Test run mode setting</td><td>Heating</td><td>Cooling</td></tr>
</table>

Forced defrost should be done as follows.

① Change the DIP SW1-1 on the outdoor controller board from OFF to ON.

② Forced defrost will start by the above operation ① if these conditions written below are satisfied.

- Heat mode setting
- 10 minutes have passed since compressor started operating or previous forced defrost finished.
- Pipe temperature is less than or equal to 8℃.

③ Forced defrost will finish if certain conditions are satisfied.

* Forced defrost can be done if above conditions are satisfied when DIP SW1-1 is changed from OFF to ON.
After DIP SW1-1 is changed from OFF to ON, there is no problem if DIP SW1-1 is left ON or changed to OFF again. This depends on the service conditions.

The black square (■) indicators a switch position.

Type of Switch	Switch	No.	Function	Action by the switch operation		Effective timing
				ON	OFF	
Dip switch	SW5	1	No function	—	—	—
		2	Switching the target sub-cool (Heating mode)	Target sub-cool down	Normal	Always
		3, 4	No function	—	—	—
		5, 6	No function	—	—	—
	SW7	1	Demand switching function	Capability cut 50%	Normal	Always
		2	No function	—	—	—
		3	Max. Frequency down	Active	Normal	Always
		4	No function	—	—	—
		5	No function	—	—	—
		6	No function	—	—	—
	SW8	1	No function	—	—	—
		2	No function	—	—	—
		3	No function	—	—	—
	SW6	1	Model selection	140V		
		2				
		3		160V		
		4				
		5		140Y		
		6				
		7		160Y		
		8				
	SW9	1	LEV opening setting function for stopping unit during heating operation	Changed	Normal	Always
		2	Switching function of defrosting prohibited time	For high humidity	Normal	Always
		3	Switching the Input Current Limit Level	3 A down	Normal	Before turning the power on
		4	During the FAN or COOL mode, and thermo - OFF in heating operation, set the opening of liner expansion valve on branch box	Active	Inactive	While unit stopping

(2) Function of connector

Types	Connector	Function	Action by Pin short operation		Effective timing
			Pin 1-2 Short	Pin 2-3 Short	
Connector	CN31	LEV opening function (at start-up)	Open a little bit	Normal	When power supply ON

<Outdoor unit operation monitor function>

Digital indicator LED3 displays 2 digit number or code to inform operation condition and the meaning of check code by controlling DIP SW2 on outdoor controller.

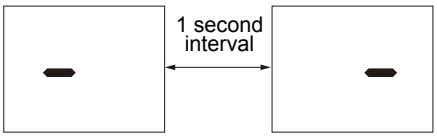
Operation indicator SW2 : Indicator change of self diagnosis

SW2 setting	Display detail	Explanation for display	Unit
ON 1 2 3 4 5 6			

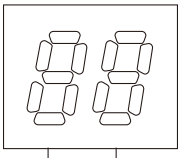
<Digital indicator LED3 working details>

(Be sure that 1 to 6 in the SW2 are set to OFF.)

(1) Display when the power supply is ON.
When the power supply is ON, blinking displays by turns.
Wait for 4 minutes at the longest.



(2) When the display lights (Normal operation)
① Operation mode display

LED3  (Lighting)

SW2
ON 1 2 3 4 5 6 (Initial setting)

The tens digit : Operation mode

Display	Operation Model
O	OFF / FAN
C	COOLING / DRY
H	HEATING
d	DEFROSTING

The ones digit : Relay output

Display	Warming-up Compressor	Compressor	4-way valve	Solenoid valve (SV1, 2)
0	—	—	—	—
1	—	—	—	ON
2	—	—	ON	—
3	—	—	ON	ON
4	—	ON	—	—
5	—	ON	—	ON
6	—	ON	ON	—
7	—	ON	ON	ON
8	ON	—	—	—
A	ON	—	ON	—

② Display during error postponement
Postponement code is displayed when compressor stops due to the work of protection device.
Postponement code is displayed while error is being postponed.

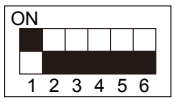
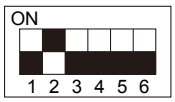
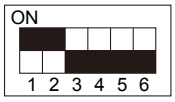
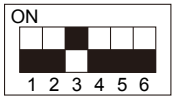
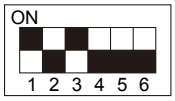
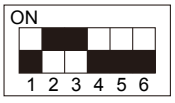
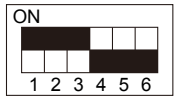
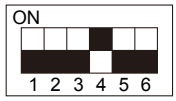
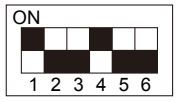
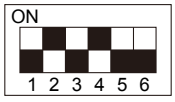
(3) When the display blinks
Inspection code is displayed when compressor stops due to the work of protection devices.

Display	Inspection unit
0	Outdoor unit, Branch box unit
1	Indoor unit

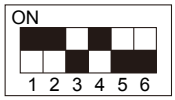
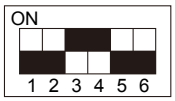
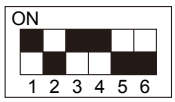
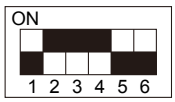
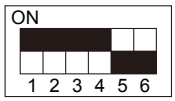
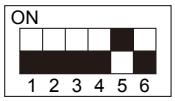
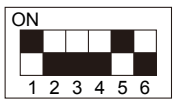
Display	Contents to be inspected (During operation)
U2	Discharge temperature fault
U7	Low-discharge superheating fault, Erroneous connection of refrigerant pipes or the connecting wires
U1	High pressure fault (63H operates)
UL	Low pressure fault (63L operates)
U6	Abnormality of power modules
UF	Compressor overcurrent shutoff (Start up locked)
UH	Current sensor fault (P. B.)
UP	Compressor overcurrent shutoff fault
U3	Discharge pipe/compressor thermistor (TH4) open or short-circuit
U4	Outdoor unit thermistors (TH3, TH6, TH7, and H8), 63HS, and branch box thermistors open or short-circuit
U5	HEATSINK temperature fault
U8	Abnormality in outdoor fan motor
U9	Voltage fault, current sensor fault (N. F.)
PA	Forced compressor stop (Overlap malfunction of drain pump in indoor unit and linear expansion valve in branch box.)

Display	Contents to be inspected (When power is turned on)
F3	63L connector(red) is open.
F5	63H connector(yellow) is open.
F9	2 connectors (63H/63L) are open.
E8	Branch box/outdoor communication error (Signal receiving error) (Outdoor unit)
	Indoor/branch box communication error (Signal receiving error) (Branch box)
E9	Branch box/outdoor communication error (Transmitting error) (Outdoor unit)
	Indoor/branch box communication error (Transmitting error) (Branch box)
EA	• Miswiring of indoor - branch box/branch box - outdoor unit connecting wire • Too many indoor units/branch box are in the system.
Eb	Miswiring of indoor - branch box/branch box - outdoor unit connecting wire(converse wiring or disconnection)
Ec	Startup time over
E0~E7	Communication error except for outdoor unit
EE, EF	Combination error, undefined error
Ed	Serial communication error

The black square (■) indicates a switch position.

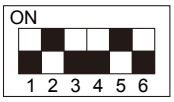
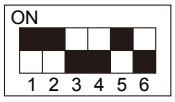
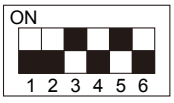
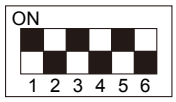
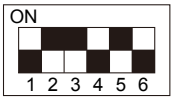
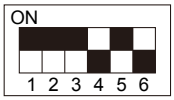
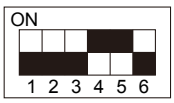
SW2 setting	Display detail	Explanation for display	Unit
	Pipe temperature / Liquid (TH3) - 40 to 90	- 40 to 90 (When the coil thermistor detects 0℃ or below, "–" and temperature are displayed by turns.) (Example) When - 10℃; 0.5 secs. 0.5secs. 2 secs. -□ →10 →□□	℃
	Compressor temperature (TH4) 3 to 217	3 to 217 (When the discharge thermistor detects 100℃ or more, hundreds digit, tens digit and ones digit are displayed by turns.) (Example) When 105℃; 0.5 secs. 0.5secs. 2 secs. □1 →05 →□□	℃
	Output step of outdoor FAN 0 to 10	0 to 10	Step
	The number of ON / OFF times of compressor 0 to 9999	0 to 9999 (When the number of times is 100 or more, hundreds digit, tens digit and ones digit are displayed by turns.) (Example) When 42500 times (425 → 100 times); 0.5 secs. 0.5 secs. 2 secs. □4 →25 →□□	100 times
	Compressor integrating operation times 0 to 9999	0 to 9999 (When it is 100 hours or more, hundreds digit, tens digit and ones digit are displayed by turns.) (Example) When 2450 hours (245 → 10 hours); 0.5 secs. 0.5 secs. 2 secs. □2 →45 →□□	10 hours
	Compressor operating current 0 to 50	0 to 50 Note: Omit the figures after the decimal fractions.	A
	Compressor operating frequency 0 to 225	0 to 255 (When it is 100Hz or more, hundreds digit, tens digit and ones digit are displayed by turns. (Example) When 125Hz; 0.5 secs. 0.5 secs. 2 secs. □1 →25 →□□	Hz
	LEV opening pulse 0 to 500 SW1: 4 5 6 Indoor unit 1: 0 0 0 Indoor unit 2: 1 0 0 Indoor unit 3: 0 1 0 Indoor unit 4: 1 1 0 Indoor unit 5: 0 0 1 Indoor unit 6: 1 0 1 Indoor unit 7: 0 1 1 Indoor unit 8: 1 1 1	0 to 500 (When it is 100 pulse or more, hundreds digit, tens digit and ones digit are displayed by turns. (Example) When 150 pulse; 0.5 secs. 0.5 secs. 2 secs. □1 →50 →□□	Pulse
	Error postponement code history (1) of outdoor unit	Postponement code display Blinking: During postponement Lighting: Cancellation of postponement "00" is displayed in case of no postponement.	Code display
	Operation mode on error occurring	Operation mode of when operation stops due to error is displayed by setting SW2 like below. (SW2)	Code display

The black square (■) indicates a switch position.

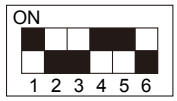
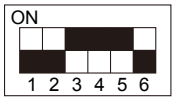
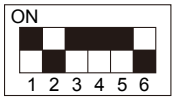
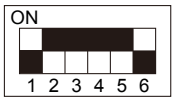
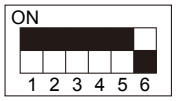
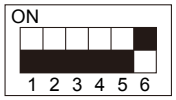
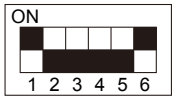
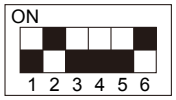
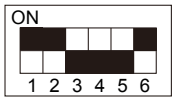
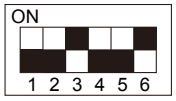
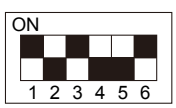
SW2 setting	Display detail	Explanation for display	Unit
	Pipe temperature / Liquid (TH3) on error occurring - 40 to 90	- 40 to 90 (When the coil thermistor detects 0℃ or below, "–" and temperature are displayed by turns.) (Example) When - 15℃; 0.5 secs. 0.5 secs. 2 secs. -□ →15 →□□	℃
	Compressor temperature (TH4) or discharge temperature (TH4) on error occurring 3 to 217	3 to 217 (When the temperature is 100℃ or more, the hundreds digit, tens digit and ones digit are displayed by turns.) (Example) When - 15℃; 0.5 secs. 0.5 secs. 2 secs. □1 →30 →□□	℃
	Compressor operating current on error occurring 0 to 50	0 to 50	A
	Check code history (1) (latest) Alternate display of abnormal unit number and code	When no check code history, " 0 " and "–" are displayed by turns.	Code display
	Check code history (2) Alternate display of error unit number and code	When no check code history, " 0 " and "–" are displayed by turns.	Code display
	Thermostat ON time 0 to 999	0 to 999 (When it is 100 minutes or more, the hundreds digit, tens digit and ones digit are displayed by turns.) (Example) When 245 minutes; 0.5 secs. 0.5 secs. 2 secs. □2 →45 →□□	Minute
	Test run elapsed time 0 to 120	0 to 120 (When it is 100 minutes or more, the hundreds digit, tens digit and ones digit are displayed by turns.) (Example) When 105 minutes; 0.5 secs. 0.5 secs. 2 secs. □1 →05 →□□	Minute
	Capacity code of indoor unit (Qj)	The capacity code of indoor unit is displayed.	Code display

	SW1		
	4	5	6
Indoor unit 1	0	0	0
Indoor unit 2	1	0	0
Indoor unit 3	0	1	0
Indoor unit 4	1	1	0
Indoor unit 5	0	0	1
Indoor unit 6	1	0	1
Indoor unit 7	0	1	1
Indoor unit 8	1	1	1

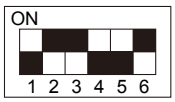
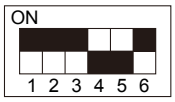
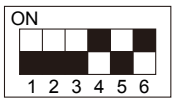
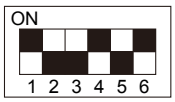
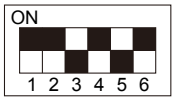
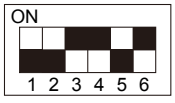
The black square (■) indicates a switch position.

<table>
<tr><th>SW2 setting</th><th>Display detail</th><th>Explanation for display</th><th>Unit</th></tr>
<tr><td> 
</td><td>Capacity setting display</td><td>Displayed as an outdoor capacity code.
<table><tr><th>Capacity</th><th>Code</th></tr><tr><td>MXZ-8B140VA/YA</td><td>25</td></tr><tr><td>MXZ-8B160VA/YA</td><td>28</td></tr></table></td><td>Code display</td></tr>
<tr><td> 
</td><td>Outdoor unit setting information</td><td>• The tens digit (Total display for applied setting)
<table><tr><th>Setting details</th><th>Display details</th></tr><tr><td>H·P / Cooling only</td><td>0 : H·P 1 : Cooling only</td></tr><tr><td>Single phase / 3 phase</td><td>0 : Single phase 2 : 3 phase</td></tr></table>• The ones digit
<table><tr><th>Setting details</th><th>Display details</th></tr><tr><td>Defrosting switch</td><td>0 : Normal 1 : For high humidity</td></tr></table>(Example) MXZ-8B140VA, “00” is displayed.</td><td>Code display</td></tr>
<tr><td> 
</td><td>Indoor pipe temperature / Liquid
- 39 to 88
<table><tr><th></th><th>SW1</th></tr><tr><td></td><td>4 5 6</td></tr><tr><td>Indoor unit 1</td><td>0 0 0</td></tr><tr><td>Indoor unit 2</td><td>1 0 0</td></tr><tr><td>Indoor unit 3</td><td>0 1 0</td></tr><tr><td>Indoor unit 4</td><td>1 1 0</td></tr><tr><td>Indoor unit 5</td><td>0 0 1</td></tr><tr><td>Indoor unit 6</td><td>1 0 1</td></tr><tr><td>Indoor unit 7</td><td>0 1 1</td></tr><tr><td>Indoor unit 8</td><td>1 1 1</td></tr></table></td><td>- 39 to 88
(When the temperature is 0℃ or less, “–” and temperature are displayed by turns.)</td><td>℃</td></tr>
<tr><td> 
</td><td>Indoor pipe temperature / Cond. / Eva.
Indoor
- 39 to 88
<table><tr><th></th><th>SW1</th></tr><tr><td></td><td>4 5 6</td></tr><tr><td>Indoor unit 1</td><td>0 0 0</td></tr><tr><td>Indoor unit 2</td><td>1 0 0</td></tr><tr><td>Indoor unit 3</td><td>0 1 0</td></tr><tr><td>Indoor unit 4</td><td>1 1 0</td></tr><tr><td>Indoor unit 5</td><td>0 0 1</td></tr><tr><td>Indoor unit 6</td><td>1 0 1</td></tr><tr><td>Indoor unit 7</td><td>0 1 1</td></tr><tr><td>Indoor unit 8</td><td>1 1 1</td></tr></table></td><td>- 39 to 88
(When the temperature is 0℃ or less, “–” and temperature are displayed by turns.)</td><td>℃</td></tr>
<tr><td> 
</td><td>Branch box pipe temperature / gas
- 39 to 88
<table><tr><th></th><th>SW1</th></tr><tr><td></td><td>4 5 6</td></tr><tr><td>Indoor unit 1</td><td>0 0 0</td></tr><tr><td>Indoor unit 2</td><td>1 0 0</td></tr><tr><td>Indoor unit 3</td><td>0 1 0</td></tr><tr><td>Indoor unit 4</td><td>1 1 0</td></tr><tr><td>Indoor unit 5</td><td>0 0 1</td></tr><tr><td>Indoor unit 6</td><td>1 0 1</td></tr><tr><td>Indoor unit 7</td><td>0 1 1</td></tr><tr><td>Indoor unit 8</td><td>1 1 1</td></tr></table></td><td>- 39 to 88
(When the temperature is 0℃ or less, “–” and temperature are displayed by turns.)</td><td>℃</td></tr>
<tr><td> 
</td><td>Targeted evaporating temperature : ETm (Cooling)
Targeted high pressure : Pdm (Heating)
- 39 to 88</td><td>- 39 to 88
(When the temperature is 0℃ or less, “–” and temperature are displayed by turns.)</td><td>℃
kgf/cm²</td></tr>
<tr><td> 
</td><td>Indoor room temperature
8 to 39
<table><tr><th></th><th>SW1</th></tr><tr><td></td><td>4 5 6</td></tr><tr><td>Indoor unit 1</td><td>0 0 0</td></tr><tr><td>Indoor unit 2</td><td>1 0 0</td></tr><tr><td>Indoor unit 3</td><td>0 1 0</td></tr><tr><td>Indoor unit 4</td><td>1 1 0</td></tr><tr><td>Indoor unit 5</td><td>0 0 1</td></tr><tr><td>Indoor unit 6</td><td>1 0 1</td></tr><tr><td>Indoor unit 7</td><td>0 1 1</td></tr><tr><td>Indoor unit 8</td><td>1 1 1</td></tr></table></td><td>8 to 39</td><td>℃</td></tr>
</table>

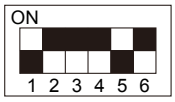
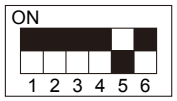
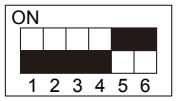
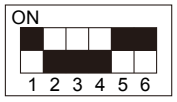
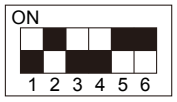
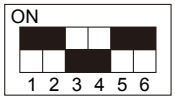
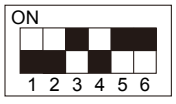
The black square (■) indicates a switch position.

SW2 setting	Display detail	Explanation for display	Unit
	Indoor setting temperature 17 to 30 SW1: 4 / 5 / 6 Indoor unit 1: 0 0 0 Indoor unit 2: 1 0 0 Indoor unit 3: 0 1 0 Indoor unit 4: 1 1 0 Indoor unit 5: 0 0 1 Indoor unit 6: 1 0 1 Indoor unit 7: 0 1 1 Indoor unit 8: 1 1 1	17 to 30	℃
	Outdoor pipe temperature / 2-phase (TH6) - 39 to 88	- 39 to 88 (When the temperature is 0℃ or less, "–" and temperature are displayed by turns.)	℃
	Outdoor temperature (TH7) - 39 to 88	- 39 to 88 (When the temperature is 0℃ or less, "–" and temperature are displayed by turns.)	℃
	Outdoor heatsink temperature (TH8) - 40 to 200	- 40 to 200 (When the temperature is 0℃ or less, "–" and temperature are displayed by turns.) (When the thermistor detects 100℃ or more, hundreds digit, tens digit and ones digit are displayed by turns.)	℃
	Discharge superheat. SHd 0 to 255	0 to 255 (When the temperature is 100°C or more, hundreds digit, tens digit and ones digit are displayed by turns.)	°C
	Sub-cool. SC (cooling mode) 0 to 130	0 to 130 (When the temperature is 100°C or more, hundreds digit, tens digit and ones digit are displayed by turns.)	°C
	Input current of outdoor unit	0 to 500 (When it is 100 or more, hundreds digit, tens digit and ones digit are displayed by turns.)	0.1 A
	High pressure 63HS	0 to 500 (When it is 100 or more, hundreds digit, tens digit and ones digit are displayed by turns.) (0 to 4.9MPa)	0.1 kgf/cm²
	Targeted operation frequency 0 to 255	0 to 255 (When it is 100Hz or more, hundreds digit, tens digit and ones digit are displayed by turns.)	Hz
	DC bus voltage V model: 180 to 370 Y model: 300 to 750	180 to 370 (When it is 100V or more, hundreds digit, tens digit and ones digit are displayed by turns.)	V
	Target Sub-cool (Cooling mode) : SCm	0 to 255	℃

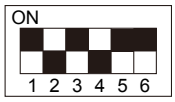
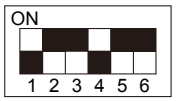
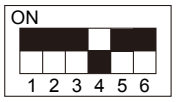
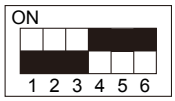
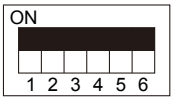
The black square (■) indicates a switch position.

SW2 setting	Display detail	Explanation for display	Unit
	Error postponement code history (2) of outdoor unit	Postponement code display Blinking: During postponement Lighting: Cancellation of postponement “00” is displayed in case of no postponement.	Code display
	Error postponement code history (3) of outdoor unit	Postponement code display Blinking: During postponement Lighting: Cancellation of postponement “00” is displayed in case of no postponement.	Code display
	Check code history (3) (Oldest) Alternate display of abnormal unit number and code	When no check code history, “0” and “–“ are displayed by turns.	Code display
	Error thermistor display [When there is no error thermistor, “–“ is displayed.]	3: Outdoor pipe temperature /Liquid (TH3) 7: Outdoor outside temperature (TH7) 8: Outdoor radiator panel (TH8) 23: Branch box pipe temperature / Gas (TH–A to E) 63: High pressure sensor (63HS)	Code display
	Operation frequency on error occurring 0 to 255	0 to 255 (When it is 100Hz or more, hundreds digit, tens digit and ones digit are displayed by turns.) (Example) When 125Hz; 0.5 secs. 0.5 secs. 2 secs. □1 →25 →□□	Hz
	Fan step on error occurring 0 to 15	0 to 15	Step
	LEV opening pulse on error occurring 0 to 500 SW1: 4 5 6 Indoor unit 1: 0 0 0 Indoor unit 2: 1 0 0 Indoor unit 3: 0 1 0 Indoor unit 4: 1 1 0 Indoor unit 5: 0 0 1 Indoor unit 6: 1 0 1 Indoor unit 7: 0 1 1 Indoor unit 8: 1 1 1	0 to 500 (When it is 100 pulse or more, hundreds digit, tens digit and ones digit are displayed by turns.) (Example) When 130 pulse; 0.5 secs. 0.5 secs. 2 secs. □1 →30 →□□ For the use of a P100 indoor unit, the sum of 2 pulse values is displayed. (Example) Indoor unit 1 (P100) = 750 pulse Indoor unit 2 (P100 other) = 400 pulse Indoor unit 1: SW1 4 5 6 = 0 0 0, Display = 500 Indoor unit 1: SW1 4 5 6 = 1 0 0, Display = 250 Indoor unit 2: SW1 4 5 6 = 0 1 0, Display = 400	Pulse
	Indoor room temperature on error occurring 8 to 39 SW1: 4 5 6 Indoor unit 1: 0 0 0 Indoor unit 2: 1 0 0 Indoor unit 3: 0 1 0 Indoor unit 4: 1 1 0 Indoor unit 5: 0 0 1 Indoor unit 6: 1 0 1 Indoor unit 7: 0 1 1 Indoor unit 8: 1 1 1	8 to 39	℃

The black square (■) indicates a switch position.

SW2 setting	Display detail	Explanation for display	Unit
	Indoor pipe temperature / Liquid on error occurring - 39 to 88 SW1: 4 5 6 Indoor unit 1: 0 0 0 Indoor unit 2: 1 0 0 Indoor unit 3: 0 1 0 Indoor unit 4: 1 1 0 Indoor unit 5: 0 0 1 Indoor unit 6: 1 0 1 Indoor unit 7: 0 1 1 Indoor unit 8: 1 1 1	- 39 to 88 (When the temperature is 0 °C or less, "–" and temperature are displayed by turns.) (Example) When - 15 °C; 0.5 secs. 0.5 secs. 2 secs. -□ →15 →□□	℃
	Indoor pipe temperature / Cond./ Eva. on error occurring - 39 to 88 SW1: 4 5 6 Indoor unit 1: 0 0 0 Indoor unit 2: 1 0 0 Indoor unit 3: 0 1 0 Indoor unit 4: 1 1 0 Indoor unit 5: 0 0 1 Indoor unit 6: 1 0 1 Indoor unit 7: 0 1 1 Indoor unit 8: 1 1 1	- 39 to 88 (When the temperature is 0 °C or less, "–" and temperature are displayed by turns.) (Example) When - 15 °C; 0.5 secs. 0.5 secs. 2 secs. -□ →15 →□□	℃
	Outdoor pipe temperature / 2-phase (TH6) on error occurring - 39 to 88	- 39 to 88 (When the temperature is 0 °C or less, "–" and temperature are displayed by turns.) (Example) When - 15 °C; 0.5 secs. 0.5 secs. 2 secs. -□ →15 →□□	℃
	Outdoor outside temperature (TH7) on error occurring - 39 to 88	- 39 to 88 (When the temperature is 0 °C or less, "–" and temperature are displayed by turns.) (Example) When - 15 °C; 0.5 secs. 0.5 secs. 2 secs. -□ →15 →□□	℃
	Outdoor heatsink temperature (TH8) on error occurring - 40 to 200	- 40 to 200 (When the temperature is 0 °C or less, "–" and temperature are displayed by turns.) (When the temperature is 100 °C or more, hundreds digit, tens digit and ones digit are displayed by turns.)	℃
	Discharge superheat on error occurring SHd 0 to 255	0 to 255 (When the temperature is 100 °C or more, hundreds digit, tens digit and ones digit are displayed by turns.) (Example) When 150 °C; 0.5 secs. 0.5 secs. 2 secs. □1 →50 →□□	℃
	Sub-cool on error occurring. SC 0 to 130	0 to 130 (When the temperature is 100 °C or more, hundreds digit, tens digit and ones digit are displayed by turns.) (Example) When 115 °C; 0.5 secs. 0.5 secs. 2 secs. □1 →15 →□□	℃

The black square (■) indicates a switch position.

<table>
<tr><th>SW2 setting</th><th>Display detail</th><th>Explanation for display</th><th>Unit</th></tr>
<tr><td> 
</td><td>Thermostat-on time until error stops
0 to 999</td><td>0 to 999
(When it is 100 minutes or more, hundreds digit, tens digit and ones digit are displayed by turns.)
(Example) When 415 minutes;
0.5 secs. 0.5 secs. 2 secs.
□4 → 15 → □□</td><td>Minute</td></tr>
<tr><td> 
</td><td>Target rotation of outdoor fan motor</td><td>0 to 999</td><td>rpm</td></tr>
<tr><td> 
</td><td>Sub-cool (Heating mode)
<table><tr><th></th><th colspan="3">SW1</th></tr><tr><th></th><th>4</th><th>5</th><th>6</th></tr><tr><td>Indoor unit 1</td><td>0</td><td>0</td><td>0</td></tr><tr><td>Indoor unit 2</td><td>1</td><td>0</td><td>0</td></tr><tr><td>Indoor unit 3</td><td>0</td><td>1</td><td>0</td></tr><tr><td>Indoor unit 4</td><td>1</td><td>1</td><td>0</td></tr><tr><td>Indoor unit 5</td><td>0</td><td>0</td><td>1</td></tr><tr><td>Indoor unit 6</td><td>1</td><td>0</td><td>1</td></tr><tr><td>Indoor unit 7</td><td>0</td><td>1</td><td>1</td></tr><tr><td>Indoor unit 8</td><td>1</td><td>1</td><td>1</td></tr></table></td><td>0 to 130</td><td>℃</td></tr>
<tr><td> 
</td><td>Code of the difference between room temperature and set temperature ("ΔTj": 0 to 99)
■ Tens digit of code: current ΔTj
■ Units digit of code: ΔTj a minute ago</td><td>Code of the difference between room temperature and set temperature ("Δtj")
<table><tr><th rowspan="2">Δtj</th><th>Cooling</th><th>Heating</th></tr><tr><th>Δtj = room temp. - Set temp.</th><th>Δtj = Set temp. - room temp.</th></tr><tr><td>0</td><td>Δtj ≦ - 0.5</td><td>Δtj ≦ - 0.5</td></tr><tr><td>1</td><td>- 1.0 < Δtj ≦ - 0.5</td><td>- 0.5 < Δtj ≦ 0.0</td></tr><tr><td>2</td><td>- 0.5 < Δtj ≦ - 0.5</td><td>0.0 < Δtj ≦ 0.5</td></tr><tr><td>3</td><td>0.0 < Δtj ≦ 0.0</td><td>0.5 < Δtj ≦ 1.0</td></tr><tr><td>4</td><td>0.5 < Δtj ≦ 0.5</td><td>1.0 < Δtj ≦ 1.5</td></tr><tr><td>5</td><td>1.0 < Δtj ≦ 1.0</td><td>1.5 < Δtj ≦ 2.0</td></tr><tr><td>6</td><td>1.5 < Δtj ≦ 0.5</td><td>2.0 < Δtj ≦ 2.5</td></tr><tr><td>7</td><td>2.0 < Δtj ≦ 2.0</td><td>2.5 < Δtj ≦ 3.0</td></tr><tr><td>8</td><td>2.5 < Δtj ≦ 2.5</td><td>3.0 < Δtj ≦ 3.5</td></tr><tr><td>9</td><td>3.0 < Δtj ≦ 3.0</td><td>3.5 < Δtj</td></tr></table>
<table><tr><th>SW setting (1 to 4, 5, 6)</th><th>Target unit</th></tr><tr><td>000</td><td>Indoor unit 1</td></tr><tr><td>100</td><td>Indoor unit 2</td></tr><tr><td>010</td><td>Indoor unit 3</td></tr><tr><td>110</td><td>Indoor unit 4</td></tr><tr><td>001</td><td>Indoor unit 5</td></tr><tr><td>101</td><td>Indoor unit 6</td></tr><tr><td>011</td><td>Indoor unit 7</td></tr><tr><td>111</td><td>Indoor unit 8</td></tr></table></td><td>Code display</td></tr>
<tr><td> 
</td><td>U9 Error status during the Error postponement period</td><td><table><tr><th>Description</th><th>Display</th></tr><tr><td>Normal</td><td>00</td></tr><tr><td>Overvoltage error</td><td>01</td></tr><tr><td>Undervoltage error</td><td>02</td></tr><tr><td>L1 phase interruption error</td><td>04</td></tr><tr><td>Abnormal power synchronous signal</td><td>08</td></tr><tr><td>PFC/ IGBT error (Undervoltage)</td><td>20</td></tr></table>
* Display examples for multiple errors:
Overvoltage (01) + Undervoltage (02) = 03
Undervoltage (02) + Power-sync signal error (08) = 0A
T phase interruption (04) + PFC error (10) = 14</td><td>Code display</td></tr>
</table>

8-9. SELECTING FUNCTIONS USING THE REMOTE CONTROLLER

Each function can be set according to necessity using the remote controller. The setting of function for each unit can only be done by the remote controller. Select function available from the table 1.

(1) Functions available when setting the unit number to 00

*1 The functions table below are available only when P-series indoor unit and the wired remote controller is used.

*2 After the power supply returns, the indoor unit does not operate for 3 minutes (Some kind of indoor units operate for 30 seconds, after that, it stops for 3 minutes).
Above operation is normal.

<Table 1> Function selections

Function	Settings	Mode No.	Setting No.	●: Initial setting (when sent from the factory)	Remarks
Power failure automatic recovery	OFF	01	1		The setting is applied to all the units in the same refrigerant system.
	ON *2		2	●	
Indoor temperature detecting	Data from the indoor unit with remote controller	02	1	●	
			2		
	Data from main remote controller		3		
LOSSNAY connectivity	Not supported	03	1	●	
	Supported (Indoor unit does not intake outdoor air through LOSSNAY)		2		
	Supported (Indoor unit intakes outdoor air through LOSSNAY)		3		
Power supply voltage	240V	04	1		
	220V,230V		2	●	
Frost prevention temperature	2℃ (Normal)	15	1	●	
	3℃		2		
Humidifier control	When the compressor operates, the humidifier also operates.	16	1	●	
	When the fan operates, the humidifier also operates.		2		

9 ELECTRICAL WIRING

9-1. EXTERNAL WIRING PROCEDURE (Fig. 9-1)

Ⓔ Power supply: 140/160V Single 220/230/240, 50 Hz 220V, 60Hz,
140/160Y 3-phase 380/400/415V, 50Hz
Max. Permissive system Impedance : 0.22(Ω)

Note:

① Power supply input: Outdoor unit only. Connect the lines (C), (D) in accordance with the terminal block names to ensure correct polarity.

② As for lines (C), S1 and S2 are for connecting the power source. And S2 and S3 are for signals. S2 is a common cable for the power source and signal.

Model	Wire diameter				Breaker	
	(A) Main power line	(B) Earth line	(C) Signal line/ Earth line	(D) Signal line/ Earth line	Interrupting current	Performance characteristic
140/160V	6.0 mm²	6.0 mm²	1.5 mm² *1/ Min. 1.5 mm²	1.5 mm²/ Min. 1.5 mm²	40 A	40 A, 30 mA for 0.1 sec. or less
140/160Y	1.5 mm²	1.5 mm²	1.5 mm² *1/ Min. 1.5 mm²	1.5 mm²/ Min. 1.5 mm²	25 A	25 A, 30 mA for 0.1 sec. or less

When using twisted wire for the wiring, the use of round terminal is required.

*1 Max 45 m (“Outdoor unit-Branch box #1” plus “branch box #1-Branch box #2”). If 2.5 mm² used, Max 55 m.

Notes: 1. Wiring size must comply with the applicable local and national code.

2. Power supply cords and Indoor unit/Branch box/Outdoor unit connecting cords shall not be lighter than polychloroprene sheathed flexible cord. (Design 60245 IEC 57)

3. Install an earth line longer than power cables.

⚠ **Warning:**

There is high voltage potential on the S3 terminal caused by electrical circuit design that has no electrical insulation between power line and communication signal line. Therefore, please turn off the main power supply when servicing. And do not touch the S1, S2, S3 terminals when the power is energized. If isolator should be used between indoor unit, branch box and outdoor unit, please use 3-pole type.

<Example 1>

(In case of 2- branch boxes)

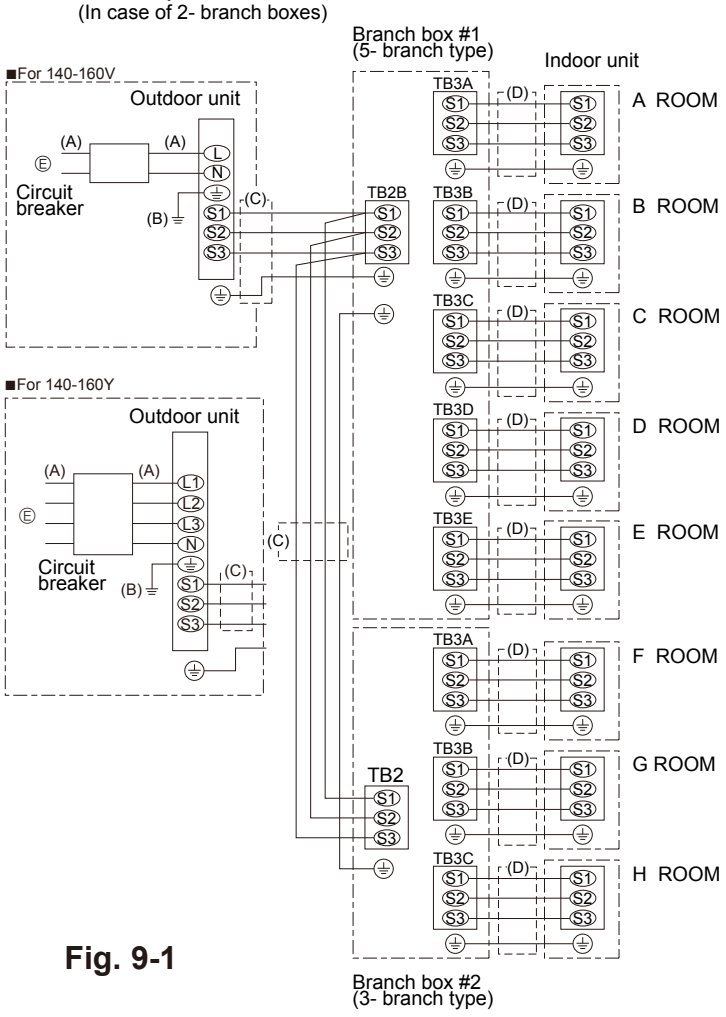


Fig. 9-1

⚠ **Warning:**

Be sure to connect the power supply cords and connecting wires for the indoor units, outdoor units, branch boxes directly to the units (no intermediate connections). Intermediate connections can lead to communication errors in the cords or wires and causes insufficient insulation to ground or a poor electrical contact at the intermediate connection point.

(If an intermediate connection is necessary, be sure to take measures to prevent water from entering the cords and wires.)

IMPORTANT

Make sure that the current leakage breaker is one compatible with higher harmonics.

Always use a current leakage breaker that is compatible with higher harmonics as this unit is equipped with an inverter.

The use of an inadequate breaker can cause the incorrect operation of inverter.

<Example 2>
(in case of wiring to P100 indoor unit(s))

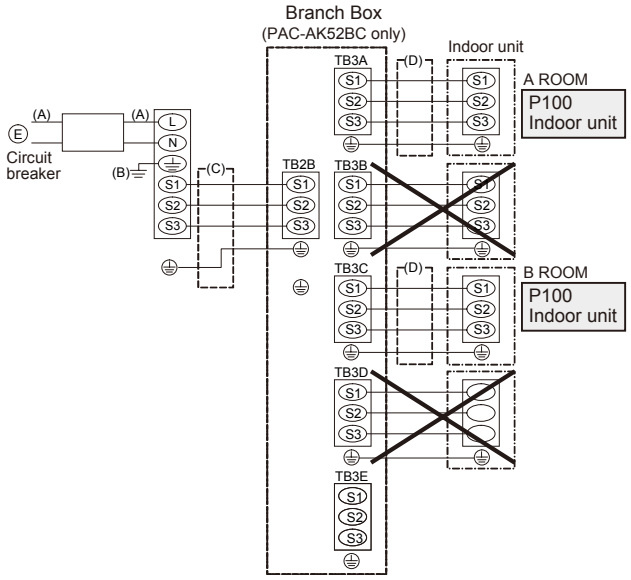


Fig. 9-2

9-2. WIRING TO P100 INDOOR UNITS (Fig. 9-2)

- When wiring P100 indoor unit(s), only use PAC-AK52BC branch box.
- When wiring a single P100 indoor unit, use TB3A.

Notes:

- **When wiring a single P100 indoor unit, ONLY use TB3A. If a single P100 indoor unit is wired to the other terminal block, an alarm will be activated, and the indoor unit will not operate.**
- **When a single P100 indoor unit is wired to TB3A, do not wire any indoor unit to TB3B. Otherwise, an alarm will be activated, and the indoor unit will not operate.**
- **TB3C, TB3D, and TB3E are available for wiring of indoor units that are not P100.**

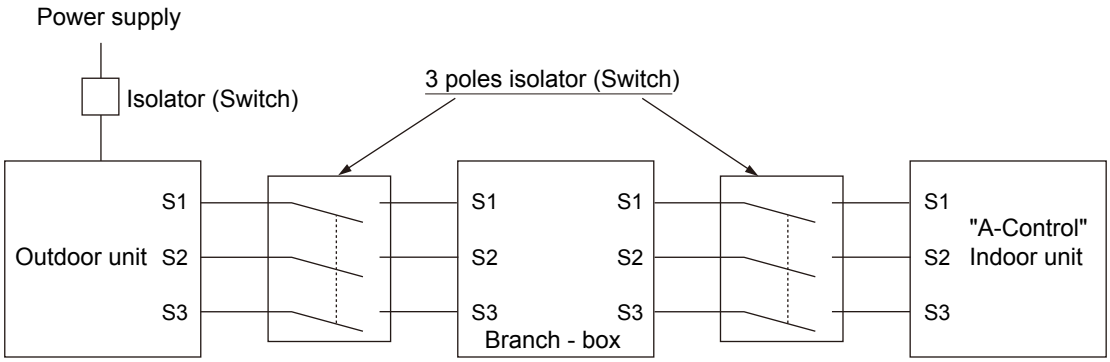
- When wiring two P100 indoor units, use TB3A and TB3C.

Notes:

- **When wiring two P100 indoor units, ONLY use TB3A and TB3C.**
  If two P100 indoor units are wired to the other terminal blocks, an alarm will be activated, and the indoor units will not operate.
- **When two P100 indoor units are wired to TB3A and TB3C respectively, do not wire any indoor unit to TB3B or TB3D. Otherwise, an alarm will be activated, and the indoor unit will not operate.**

10 WIRING SPECIFICATIONS

⚠ **Warning:**
In case of A-control wiring, there is high voltage potential on the S3 terminal caused by electrical circuit design that has no electrical insulation between power line and communication signal line. Therefore, please turn off the main power supply when servicing. And do not touch the S1, S2, S3 terminals when the power is energized. If isolator should be used between outdoor unit and branch box / indoor units and branch box, please use 3-pole type.



<CAUTION>
After using isolator, be sure to turn off and on the main power supply to reset the system.
Otherwise, outdoor unit may not be able to detect the branch box(es) or indoor units.

WIRING SPECIFICATIONS
(OUTDOOR-BRANCH BOX CONNECTING CABLE)

Cross section of cable	Wire size (㎟)	Number of wires	Polarity	L (m) ※ 6
Round	2.5	3	Clockwise : S1-S2-S3 ※ Pay attention to stripe of yellow and green.	(50) ※ 2
Flat	2.5	3	Not applicable (Because center wire has no cover finish)	Not applicable ※ 5
Flat	1.5	4	From left to right : S1-Open-S2-S3	(45) ※ 3
Round	2.5	4	Clockwise : S1-S2-S3-Open ※ Connect S1 and S3 to the opposite angle.	(55) ※ 4

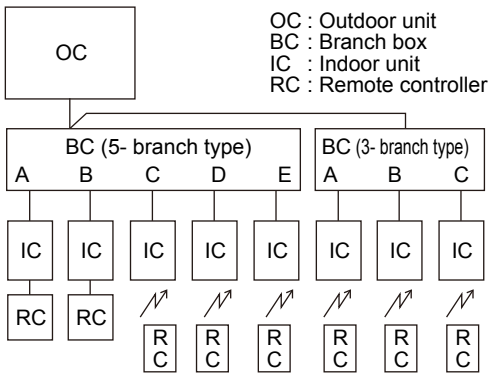
*1 : Power supply cords of appliances shall not be lighter than design 60245 IEC or 60227 IEC.
*2 : In case that cable with stripe of yellow and green is available.
*3 : In case of regular polarity connection (S1-S2-S3), wire size is 1.5 ㎟.
*4 : In case of regular polarity connection (S1-S2-S3).
*5 : In the flat cables are connected as this picture, they can be used up to 55 m.

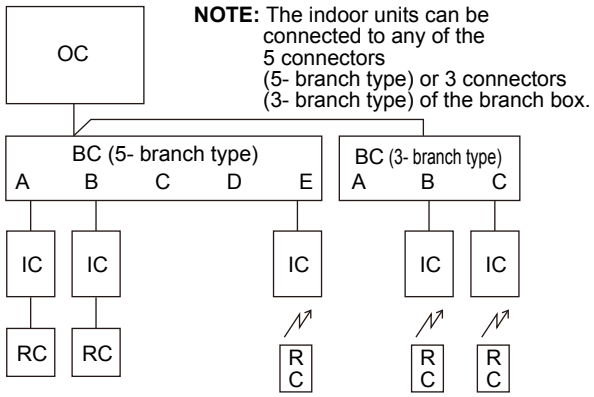
*6 : Mentioned cable length is just a reference value.
It may be different depending on the condition of installation, humidity or materials, etc.

Be sure to connect the outdoor-branch box / indoor units-branch box connecting cables directly to the units (no intermediate connections).
Intermediate connections can lead to communication errors if water enters the cables and causes insufficient insulation to ground or a poor electrical contact at the intermediate connection point.
(If an intermediate connection is necessary, be sure to take measures to prevent water from entering the cables.)

11 SYSTEM CONTROL

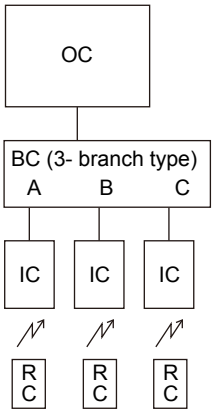
11-1. BASIC SYSTEMS



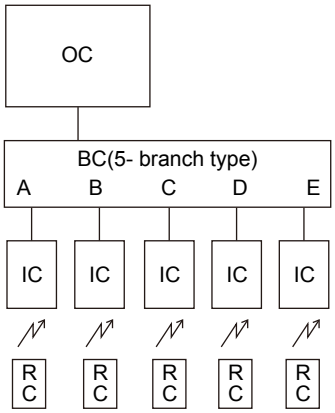


11-2. STANDARD SYSTEMS

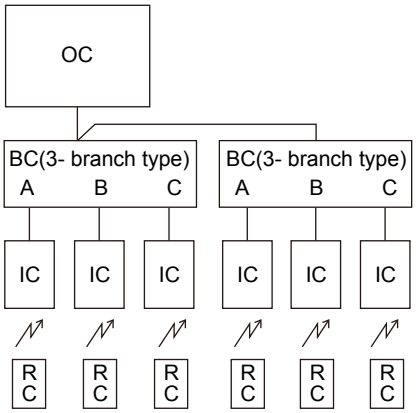
11-2-1. Only 3-branch type



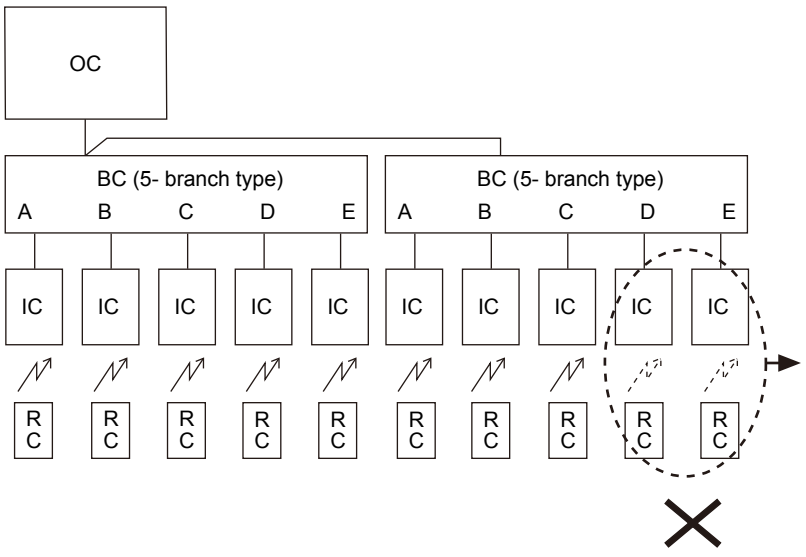
11-2-2. Only 5-branch type



11-2-3. 2-branch boxes (3-branch type)



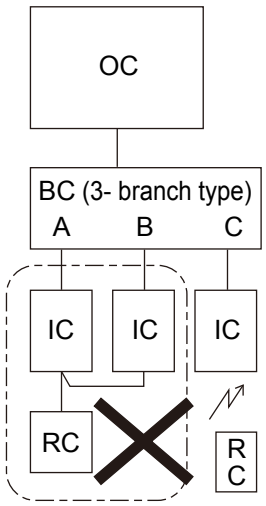
11-2-4. 2-branch boxes (5-branch type, maximum 8 indoor units)



1. Up to 2 branch boxes can be connected to a single outdoor unit.
2. Up to 8 indoor units can be connected to the system.

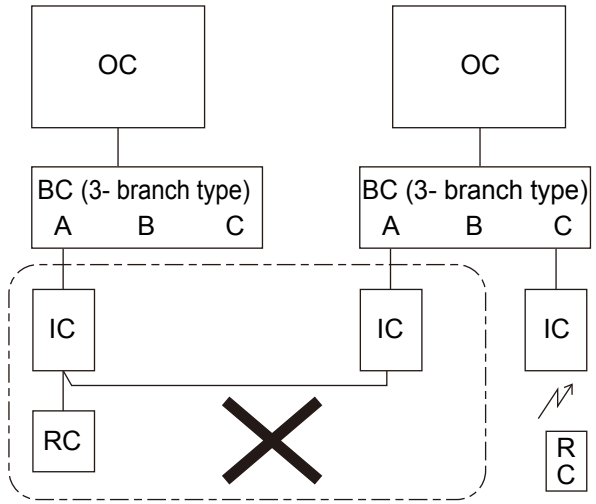
11-3. INCORRECT SYSTEMS

11-3-1. Group operation by single remote controller



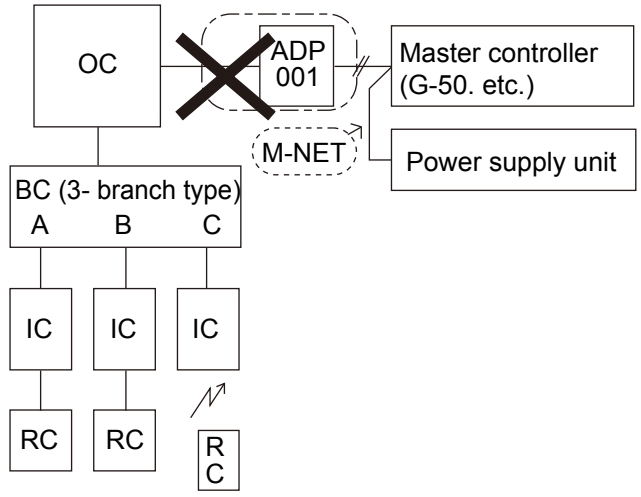
• Plural indoor units cannot be operated by a single remote controller.

11-3-2. Group operation between different refrigerant systems



• Different refrigerant systems cannot be connected together.

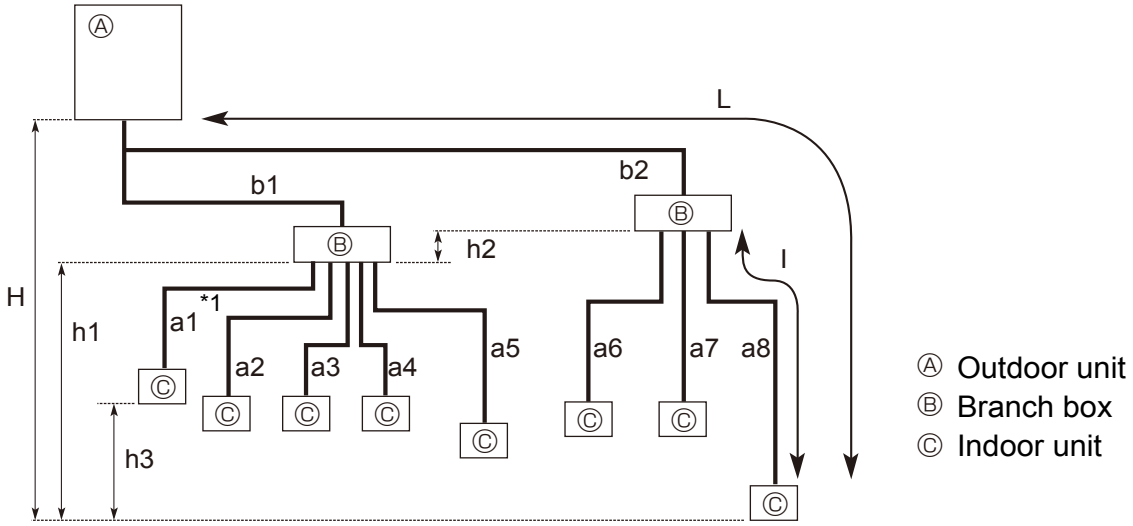
11-3-3. Connection of M-NET adapter to outdoor unit



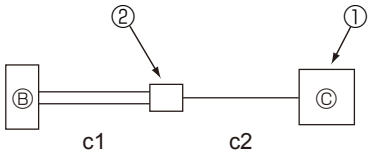
• A M-NET adapter cannot be connected to an outdoor unit.

12 REFRIGERANT PIPING TASK

12-1. ADDITIONAL REFRIGERANT CHARGE



*1 Although two refrigerant pipes are used between the branch box and the Y-shape connection pipe when connecting the P100 indoor unit, calculate the piping lengths using only the length of one pipe.



① Indoor unit [P100 type]
② Y-shape connection pipe
a1 = c1 + c2

Permissible length (one-way)	Total piping length	b1 + b2 + a1+ a2 + a3 + a4 + a5 + a6 + a7 + a8 ≦ 115m
	Farthest piping length (L)	b2 + a8 ≦ 70m (b2 ≦ 55m, a8 ≦ 15m)
	Piping length between outdoor unit and branch boxes	b1 + b2 ≦ 55m
	Farthest piping length after branch box (l)	a8 ≦ 15m
	Total piping length between branch boxes and indoor units	a1+ a2 + a3 + a4 + a5 + a6 a7 + a8 ≦ 60m
Permissible height difference (one-way)	In indoor / outdoor section (H) *2	H ≦ 30m (In case of that outdoor unit is set higher than indoor unit)
		H ≦ 20m (In case of that outdoor unit is set lower than indoor unit)
	In branch box / indoor unit section (h1)	h1 + h2 ≦ 15m
	In each branch unit (h2)	h2 ≦ 15m
	In each indoor unit (h3)	h3 ≦ 12m
Number of bends		| b1 + a1 |,| b1 + a2 |,| b1 + a3 |,| b1 + a4 |,| b1 + a5 |,| b2 + a6 |, | b2 + a7 |,| b2 + a8 | ≦ 15

*2 Branch box should be placed with in the level between the outdoor unit and indoor units.

- Additional charging is not necessary for this unit if the total pipe length (b1 + b2 + a1 + a2 + a3 + a4 + a5 + a6 + a7 + a8) does not exceed 40 m.
- If the total pipe length exceeds 40 m, charge the unit with additional R410A refrigerant according to the permitted pipe lengths in the chart on the next page.

After charging the unit with refrigerant, note the added refrigerant amount on the service label (attached to the unit).

Refer to the “installation manual” for more information.

<Table 1>

Total piping length (b1+ b2 + a1+ a2 + a3 + a4 + a5 + a6 + a7 + a8)	40m or less	41 – 50m	51 – 70m	71 – 90m	91 – 115m
Additional refrigerant charging amount	0kg (no need)	0.6kg	1.4kg	2.2kg	3.2kg
* **Reference (for service)** The amount of refilling refrigerant charge	8.5kg (8.5 + 0)	9.1kg (8.5 + 0.6)	9.9kg (8.5 + 1.4)	10.7kg (8.5 + 2.2)	11.7kg (8.5 + 3.2)

If connecting an indoor unit with ϕ9.52 liquid pipes (model number 71 or more for M-and S-series and model number 60 or more for P-series), the additional refrigerant charging amount in Table 1 must be corrected (add the following R value from the value given in Table 1).

Additional refrigerant charging correction amount
R=0.01 [kg/m] × ϕ9.52 branch pipe (liquid pipe) total length [m]

Example) b1 = 20m, b2 = 25m

Indoor unit A	ϕ9.52 liquid pipe	a1 = 12m
Indoor unit B	ϕ6.35 liquid pipe	a2 = 11m
Indoor unit C	ϕ6.35 liquid pipe	a6 = 14m
Indoor unit D	ϕ9.52 liquid pipe	a7 = 13m

Total piping length : b1 + b2 + a1 + a2 + a6 + a7 = 95m
→ According to Table 1, the additional refrigerant charging amount is 3.2kg.
Because indoor units with ϕ9.52 liquid pipes are connected (indoor units A and D in this example), the additional refrigerant charging amount must be corrected.

Additional refrigerant charging correction amount
R = 0.01 [kg/m] × ϕ9.52 branch pipe (liquid pipe) total length (a1 + a7)
= 0.01 × (12 + 13m)
= 0.25kg

Therefore, the additional refrigerant charging amount is 3.2kg + 0.25kg = 3.45kg.

* Reference
The refilling amount of refrigerant at servicing

Example) 3.45 + 8.5 = 11.95kg
The amount of refrigerant of initial charge (8.5kg) is added.

* Although two ø6.35 liquid pipes are used between the branch box and the Y-shape connection pipe when connecting the P100 indoor unit, calculate the additional refrigerant charging amount assuming only one ø9.52 liquid pipe is used.

12-2. REFRIGERANT COLLECTING (PUMP DOWN)

Perform the following procedures to collect the refrigerant when moving the indoor unit or the outdoor unit.
① Turn off the circuit breaker.
② Connect the low pressure side of the gauge manifold to the service port of the gas side stop valve.
③ Close the liquid stop value.
④ Supply power (circuit breaker).
* Start-up of the indoor-outdoor communication takes about 3 minutes after the power (circuit breaker) is turned on. Start the pump-down operation 3 to 4 minutes after the power (circuit breaker) is turned ON.
⑤ Perform the test run for cooling operation (SW4-1: ON and SW4-2: OFF). The compressor (outdoor unit) and ventilators (indoor and outdoor units) start operating and test run for cooling operation begins.
* Only set the SW4-1 and SW4-2 to ON if the unit is stopped. However, even if the unit is stopped and the SW4-1 and SW4-2 are set to ON less than 3 minutes after the compressor stops, the refrigerant collecting operation cannot be performed. Wait until compressor has been stopped for 3 minutes and then set the SW4-1 and SW4-2 to ON again.
⑥ Fully close the gas stop valve when the pressure reading on the gauge drops 0.05 - 0.00 MPa (approximately 0.5 - 0.0 kgf/cm²)
⑦ Stop the air conditioner operation. (SW4-1: OFF and SW4-2: OFF)
⑧ Turn off the power supply (circuit breaker).
* If too much refrigerant has been added to the air conditioner system, the pressure may not drop to 0.5 kgf/cm². If this occurs, use a refrigerant collecting device to collect all of the refrigerant in the system, and then recharge the system with the correct amount of refrigerant after the indoor and outdoor units have been relocated.

⚠ **Warning:**
When pumping down the refrigerant, stop the compressor before disconnecting the refrigerant pipes. The compressor may burst if air etc. get into it.

12-3. PRECAUTIONS AGAINST REFRIGERANT LEAKAGE

12-3-1. Introduction

R410A refrigerant of this air conditioner is non-toxic and non-flammable but leaking of large amount from an indoor unit into the room where the unit is installed may be deleterious.

To prevent possible injury, the rooms should be large enough to keep the R410A concentration specified by ISO 5149-1 as follows.

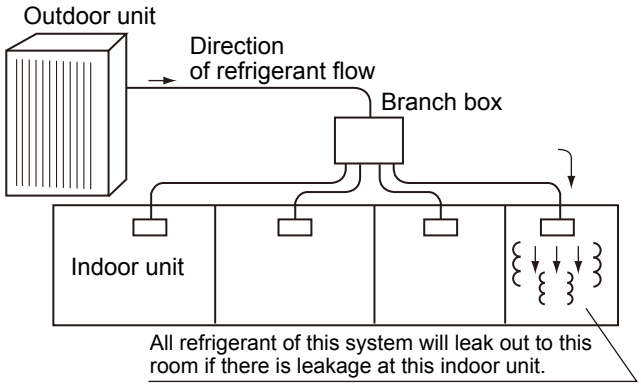
Maximum concentration

Maximum refrigerant concentration of R410A of a room is 0.44 kg/m³ accordance with ISO 5149-1.

To facilitate calculation, the maximum concentration is expressed in units of kg/m³ (kg of R410A per m³)

Maximum concentration of R410A: 0.44kg/m³

(ISO 5149-1)



12-3-2. Confirming procedure of R410A concentration

Follow (1) to (3) to confirm the R410A concentration and take appropriate treatment, if necessary.

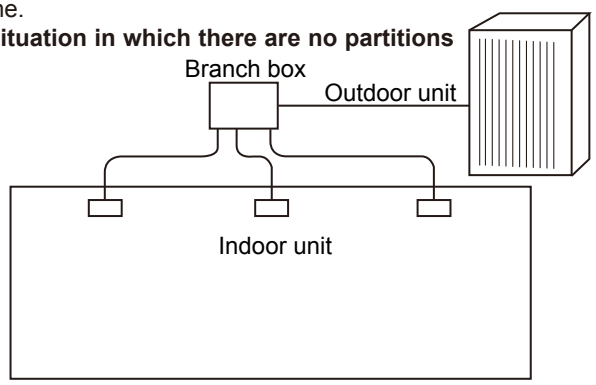
(1) Calculate total refrigerant amount by each refrigerant system.
Total refrigerant amount is precharged refrigerant at ex-factory plus additional charged amount at field installation.

Note:
When single refrigeration system consists of several independent refrigeration circuit, figure out the total refrigerant amount by each independent refrigerant circuit.

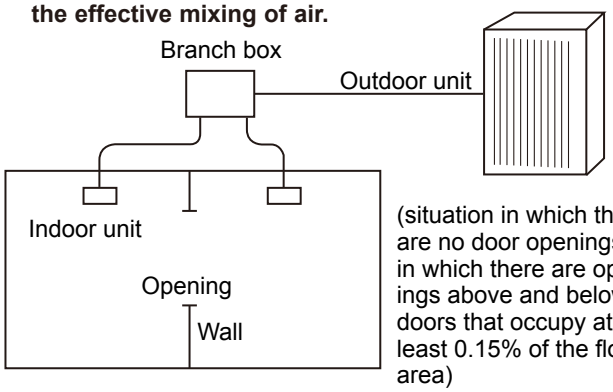
(2) Calculate room volumes (m³) and find the room with the smallest volume

The part with ▭ represents the room with the smallest volume.

(a) Situation in which there are no partitions

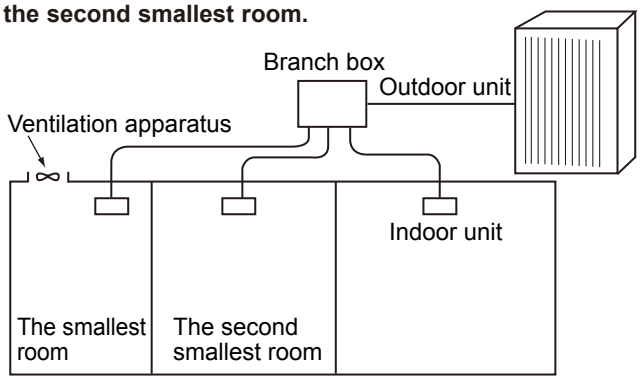


(b) There are partitions, but there are openings that allow the effective mixing of air.



(situation in which there are no door openings or in which there are openings above and below doors that occupy at least 0.15% of the floor area)

(c) If the smallest room has mechanical ventilation apparatus that is linked to a household gas detection and alarm device, the calculations should be performed for the second smallest room.



(3) Use the results of calculations (1) and (2) to calculate the refrigerant concentration:

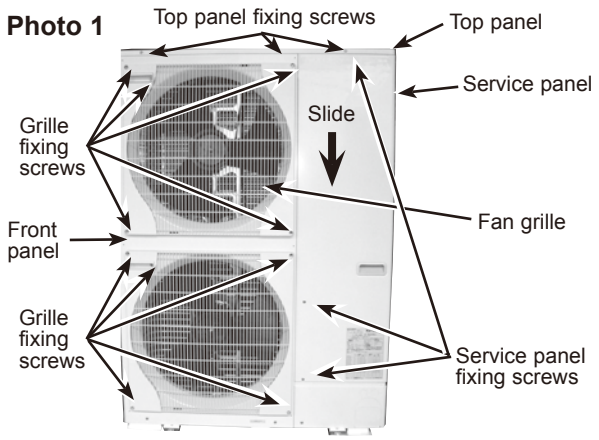
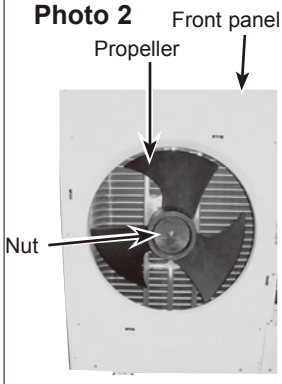
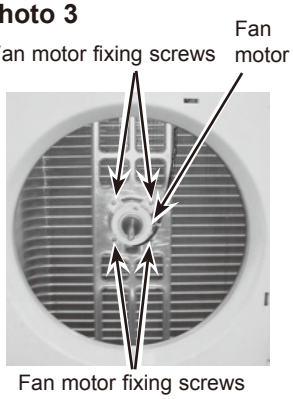
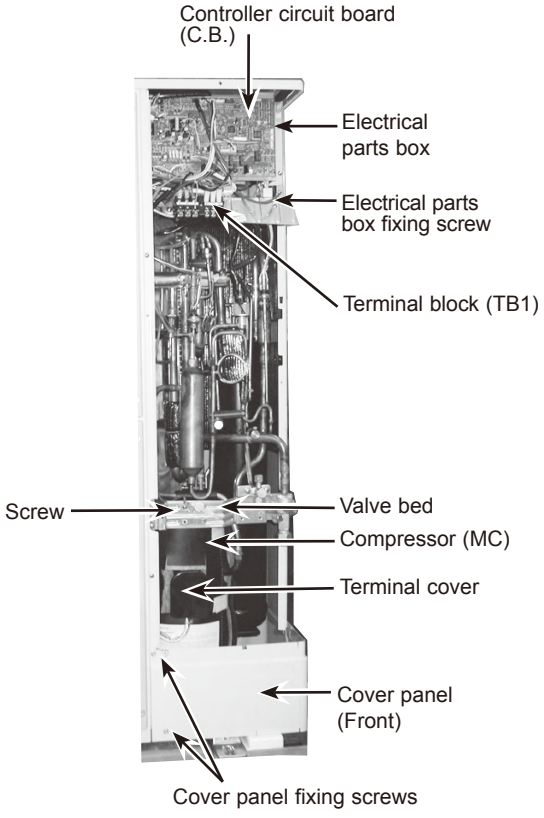
$$\frac{\text{Total refrigerant in the refrigerating unit (kg)}}{\text{The smallest room in which an indoor unit has been installed (m³)}} \leqq \text{Maximum concentration (kg/m³)}$$

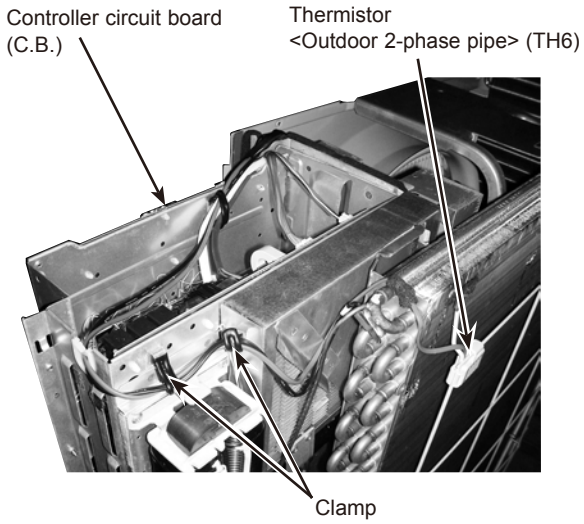
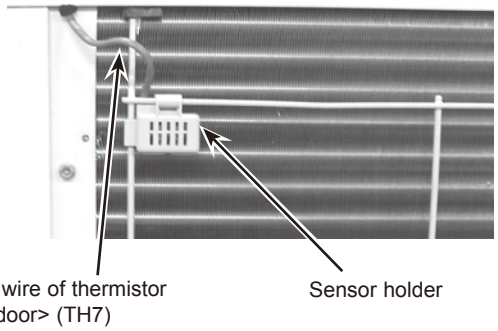
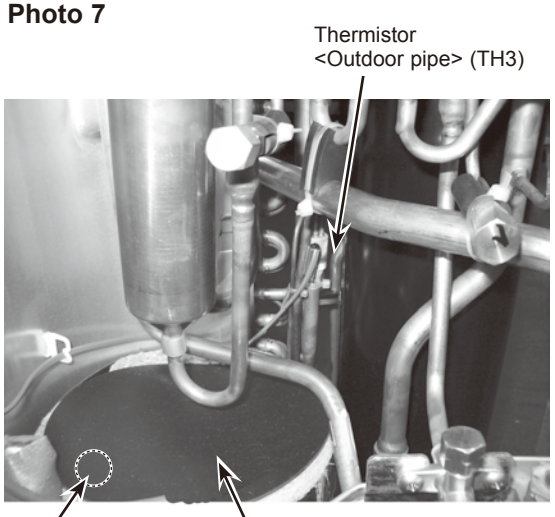
Maximum concentration of R410A: 0.44kg/m³

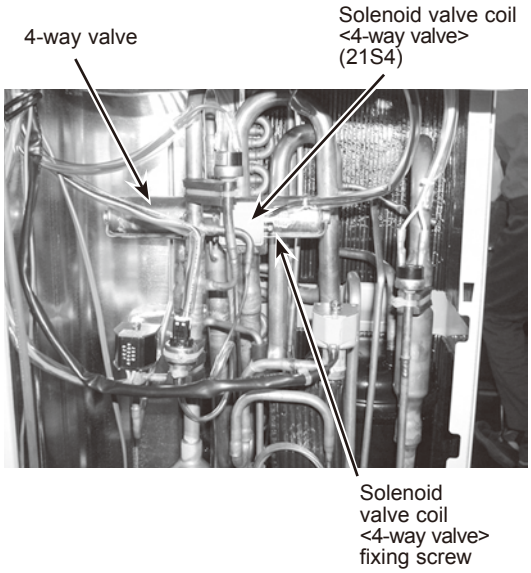
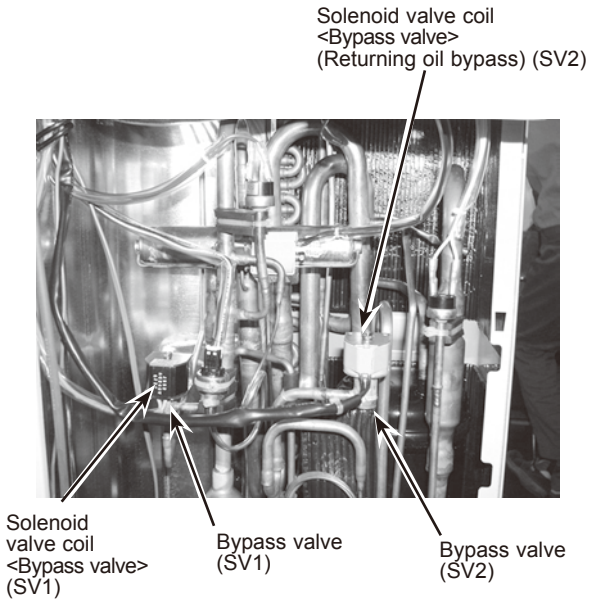
If the calculation results do not exceed the maximum concentration, perform the same calculations for the larger second and third room, etc., until it has been determined that the maximum concentration does not exceed in each room.

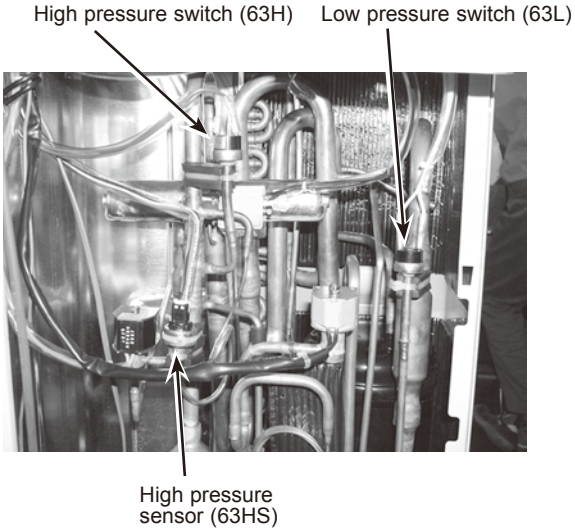
13 DISASSEMBLY PROCEDURE

MXZ-8B140VA MXZ-8B140YA MXZ-8B160VA MXZ-8B160YA

OPERATING PROCEDURE	PHOTOS & ILLUSTRATION
1. Removing the service panel and top panel (1) Remove 3 service panel fixing screws (5 × 12) and slide the hook on the right downward to remove the service panel. (2) Remove screws (3 for front, 3 for rear/5 × 12) of the top panel and remove it.	**Photo 1** 
2. Removing the fan motor (MF1, MF2) (1) Remove the service panel. (See Photo 1) (2) Remove the top panel. (See Photo 1) (3) Remove 5 fan grille fixing screws (5 × 12) to detach the fan grille. (See Photo 1) (4) Remove a nut (for right handed screw of M6) to detach the propeller. (See Photo 2) (5) Disconnect the connectors, CNF1 and CNF2 on controller circuit board in electrical parts box. (6) Remove 4 fan motor fixing screws (5 × 25) to detach the fan motor. (See Photo 3)	**Photo 2**  **Photo 3** 
3. Removing the electrical parts box (1) Remove the service panel. (See Photo 1) (2) Remove the top panel. (See Photo 1) (3) Disconnect the indoor/outdoor connecting wire from terminal block. (4) Remove all the following connectors from controller circuit board; fan motor, thermistor <Outdoor pipe>, thermistor <Compressor>, thermistor <Outdoor 2-phase pipe>, thermistor <Outdoor>, high pressure switch, high pressure sensor, low pressure switch, solenoid valve coil <4-way valve> and solenoid valve coil <Hot gas bypass>, solenoid valve coil <Returning oil bypass>. Then remove a screw (4 × 8) from the valve bed to remove the lead wire. Pull out the disconnected wire from the electrical parts box. <Diagram symbol in the connector housing> • Fan motor (CNF1, CNF2) • Thermistor <Outdoor pipe> (TH3) • Thermistor <Compressor> (TH4) • Thermistor <Outdoor 2-phase pipe, Outdoor> (TH7/6) • High pressure switch (63H) • High pressure sensor (63HS) • Low pressure switch (63L) • Solenoid valve coil <4-way valve> (21S4) • Solenoid valve coil <Bypass valve> (SV1) • Solenoid valve coil (Returning oil bypass) <Bypass valve> (SV2) (5) Remove the terminal cover and disconnect the compressor lead wire. (6) Remove an electrical parts box fixing screw (4 × 10) and detach the electrical parts box by pulling it upward. The electrical parts box is fixed with 2 hooks on the left and 1 hook on the right.	**Photo: MXZ-8B140/160VA** **Photo 4** 

OPERATING PROCEDURE	PHOTOS
4. Removing the thermistor <Outdoor 2-phase pipe> (TH6) (1) Remove the service panel. (See Photo 1) (2) Remove the top panel. (See Photo 1) (3) Disconnect the connectors, TH6 and TH7 (red), on the controller circuit board in the electrical parts box. (4) Loosen the clamp for the lead wire in the rear of the electrical parts box. (5) Pull out the thermistor <Outdoor 2-phase pipe> (TH6) from the sensor holder. Note: In case of replacing thermistor <Outdoor 2-phase pipe> (TH6), replace it together with thermistor <Outdoor> (TH7) since they are combined together. Refer to No.5 below to remove thermistor <Outdoor>.	**Photo 5** 
5. Removing the thermistor <Outdoor> (TH7) (1) Remove the service panel. (See Photo 1) (2) Remove the top panel. (See Photo 1) (3) Disconnect the connector TH7 (red) on the controller circuit board in the electrical parts box. (4) Loosen the clamp for the lead wire in the rear of the electrical parts box. (See Photo 5) (5) Pull out the thermistor <Outdoor> (TH7) from the sensor holder. Note: In case of replacing thermistor <Outdoor> (TH7), replace it together with thermistor <Outdoor 2-phase pipe> (TH6), since they are combined together. Refer to No.4 above to remove thermistor <Outdoor 2-phase pipe>.	**Photo 6** 
6. Removing the thermistor <Outdoor pipe> (TH3) and thermistor <Compressor> (TH4) (1) Remove the service panel. (See Photo 1) (2) Disconnect the connectors, TH3 (white) and TH4 (white), on the controller circuit board in the electrical parts box. (3) Loosen the clamp for the lead wire in the rear of the electrical parts box. (See Photo 5) (4) Pull out the thermistor <Outdoor pipe> (TH3) and thermistor <Compressor> (TH4) from the sensor holder.	**Photo 7** 

OPERATING PROCEDURE	PHOTOS
7. Removing the solenoid valve coil <4-way valve> (21S4) (1) Remove the service panel. (See Photo 1) (2) Remove the top panel. (See Photo 1) **[Removing the solenoid valve coil <4-way valve>]** (3) Remove 4-way valve solenoid coil fixing screw (M5 × 6). (4) Remove the solenoid valve coil <4-way valve> by sliding the coil toward you. (5) Disconnect the connector 21S4 (green) on the controller circuit board in the electrical parts box.	**Photo 8** 
8. Removing the 4-way valve (1) Remove the service panel. (See Photo 1) (2) Remove the top panel. (See Photo 1) (3) Remove 3 valve bed fixing screws (4 × 10) and 4 ball valve and stop valve fixing screws (5 × 16) and then remove the valve bed. (4) Remove 4 right side panel fixing screws (5 × 12) in the rear of the unit and then remove the right side panel. (5) Remove the solenoid valve coil <4-way valve>. (See Photo 8) (6) Recover refrigerant. (7) Remove the welded part of 4-way valve. Note 1: Recover refrigerant without spreading it in the air. Note 2: The welded part can be removed easily by removing the right side panel. Note 3: When installing the 4-way valve, cover it with a wet cloth to prevent it from heating (120°C or more), then braze the pipes so that the inside of pipes are not oxidized.	
9. Removing solenoid valve coil <Bypass valve> (SV1) and bypass valve (1) Remove the service panel. (See Photo 1) (2) Remove the top panel. (See Photo 1) (3) Remove the electrical parts box. (See Photo 5) (4) Remove 3 right side panel fixing screws (5 × 12) in the rear of the unit and remove the right side panel. (5) Remove the bypass valve coil fixing screw (M4 × 6). (6) Remove the solenoid valve coil <Bypass valve> (SV1) by sliding the coil upward. (7) Recover refrigerant. (8) Remove the welded part of bypass valve. Note 1: Recover refrigerant without spreading it in the air. Note 2: The welded part can be removed easily by removing the right side panel.	**Photo 9** 
10. Removing solenoid valve coil (Returning oil bypass) <Bypass valve> (SV2) and bypass valve (1) Remove the service panel. (See Photo 1) (2) Remove the top panel. (See Photo 1) (3) Remove the electrical parts box. (See Photo 5) (4) Remove 3 right side panel fixing screws (5 × 12) in the rear of the unit and remove the right side panel. (5) Remove the bypass valve coil fixing screw (M5 × 6). (6) Remove the solenoid valve coil (Returning oil bypass) <Bypass valve> (SV2) by sliding the coil upward. (7) Recover refrigerant. (8) Remove the welded part of bypass valve. Note 1: Recover refrigerant without spreading it in the air. Note 2: The welded part can be removed easily by removing the right side panel.	

OPERATING PROCEDURE	PHOTOS
11. Removing the high pressure switch (63H) and low pressure switch (63L) (1) Remove the service panel. (See Photo 1) (2) Remove the top panel. (See Photo 1) (3) Remove the electrical parts box. (See Photo 5) (4) Remove 3 right side panel fixing screws (5 × 12) in the rear of the unit and remove the right side panel. (5) Pull out the lead wire of high pressure switch and low pressure switch. (6) Recover refrigerant. (7) Remove the welded part of high pressure switch and low pressure switch. Note 1: Recover refrigerant without spreading it in the air. Note 2: The welded part can be removed easily by removing the right side panel. Note 3: When installing the high pressure switch and low pressure switch, cover them with a wet cloth to prevent them from heating (100 °C or more), then braze the pipes so that the inside of pipes are not oxidized.	**Photo 10** 
12. Removing the high pressure sensor (63HS) (1) Remove the service panel. (See Photo 1) (2) Remove the top panel. (See Photo 1) (3) Remove the electrical parts box. (See Photo 5) (4) Remove 3 right side panel fixing screws (5 × 12) in the rear of the unit and remove the right side panel. (5) Pull out the lead wire of high pressure sensor. (6) Recover refrigerant. (7) Remove the welded part of high pressure sensor. Note 1: Recover refrigerant without spreading it in the air. Note 2: The welded part can be removed easily by removing the right side panel. Note 3: When installing the high pressure sensor, cover it with a wet cloth to prevent it from heating (100°C or more), then braze the pipes so that the inside of pipes are not oxidized.	

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MXZ-8B140VA

Before calculating the sum of total capacity of indoor units, please convert the value into the kW model capacity following the formula on "4-1-2. Method of obtaining the heating and cooling capacity of an indoor unit:".

Total capacity of indoor unit	Capacity (W)		Power Consumption (kW)		Current(A)/220V		Current(A)/230V		Current(A)/240V	
	Cooling	Heating	Cooling	Heating	Cooling	Heating	Cooling	Heating	Cooling	Heating
15	1500	1700	0.80	0.58	3.7	2.7	3.5	2.5	3.4	2.4
16	1600	1800	0.84	0.62	3.9	2.8	3.7	2.7	3.5	2.6
17	1700	1900	0.87	0.65	4.0	3.0	3.8	2.9	3.7	2.7
18	1800	2100	0.91	0.72	4.2	3.3	4.0	3.2	3.8	3.0
19	1900	2200	0.95	0.76	4.4	3.5	4.2	3.3	4.0	3.2
20	2000	2300	0.98	0.79	4.5	3.6	4.3	3.5	4.1	3.3
21	2100	2400	1.02	0.82	4.7	3.8	4.5	3.6	4.3	3.5
22	2200	2500	1.05	0.86	4.8	3.9	4.6	3.8	4.4	3.6
23	2300	2600	1.08	0.89	5.0	4.1	4.7	3.9	4.5	3.7
24	2400	2700	1.11	0.93	5.1	4.3	4.9	4.1	4.7	3.9
25	2500	2900	1.14	1.00	5.2	4.6	5.0	4.4	4.8	4.2
26	2600	3000	1.17	1.03	5.4	4.7	5.1	4.5	4.9	4.3
27	2700	3100	1.20	1.06	5.5	4.9	5.3	4.7	5.1	4.5
28	2800	3200	1.23	1.10	5.6	5.1	5.4	4.8	5.2	4.6
29	2900	3300	1.26	1.13	5.8	5.2	5.5	5.0	5.3	4.8
30	3000	3400	1.28	1.17	5.9	5.4	5.6	5.1	5.4	4.9
31	3100	3500	1.31	1.20	6.0	5.5	5.8	5.3	5.5	5.1
32	3200	3700	1.33	1.27	6.1	5.8	5.8	5.6	5.6	5.3
33	3300	3800	1.36	1.31	6.2	6.0	6.0	5.8	5.7	5.5
34	3400	3900	1.38	1.34	6.3	6.2	6.1	5.9	5.8	5.6
35	3500	4000	1.41	1.37	6.5	6.3	6.2	6.0	5.9	5.8
36	3600	4100	1.43	1.41	6.6	6.5	6.3	6.2	6.0	5.9
37	3700	4200	1.45	1.44	6.7	6.6	6.4	6.3	6.1	6.1
38	3800	4300	1.47	1.48	6.7	6.8	6.5	6.5	6.2	6.2
39	3900	4500	1.49	1.55	6.8	7.1	6.5	6.8	6.3	6.5
40	4000	4600	1.51	1.58	6.9	7.3	6.6	6.9	6.4	6.6
41	4100	4700	1.53	1.61	7.0	7.4	6.7	7.1	6.4	6.8
42	4200	4800	1.55	1.65	7.1	7.6	6.8	7.2	6.5	6.9
43	4300	4900	1.57	1.68	7.2	7.7	6.9	7.4	6.6	7.1
44	4400	5000	1.59	1.72	7.3	7.9	7.0	7.6	6.7	7.2
45	4500	5100	1.61	1.75	7.4	8.0	7.1	7.7	6.8	7.4
46	4600	5300	1.63	1.82	7.5	8.4	7.2	8.0	6.9	7.7
47	4700	5400	1.65	1.86	7.6	8.5	7.2	8.2	6.9	7.8
48	4800	5500	1.66	1.89	7.6	8.7	7.3	8.3	7.0	8.0
49	4900	5600	1.68	1.92	7.7	8.8	7.4	8.4	7.1	8.1
50	5000	5700	1.70	1.96	7.8	9.0	7.5	8.6	7.2	8.2
51	5100	5800	1.73	2.00	7.9	9.2	7.6	8.8	7.3	8.4
52	5200	5900	1.76	2.03	8.1	9.3	7.7	8.9	7.4	8.5
53	5300	6100	1.79	2.10	8.2	9.6	7.9	9.2	7.5	8.8
54	5400	6200	1.82	2.14	8.4	9.8	8.0	9.4	7.7	9.0
55	5500	6300	1.85	2.18	8.5	10.0	8.1	9.6	7.8	9.2
56	5600	6400	1.88	2.21	8.6	10.1	8.3	9.7	7.9	9.3
57	5700	6500	1.91	2.25	8.8	10.3	8.4	9.9	8.0	9.5
58	5800	6600	1.94	2.29	8.9	10.5	8.5	10.1	8.2	9.6
59	5900	6700	1.97	2.32	9.0	10.7	8.7	10.2	8.3	9.8
60	6000	6900	2.00	2.40	9.2	11.0	8.8	10.5	8.4	10.1
61	6100	7000	2.03	2.43	9.3	11.2	8.9	10.7	8.5	10.2
62	6200	7100	2.06	2.47	9.5	11.3	9.0	10.8	8.7	10.4
63	6300	7200	2.08	2.51	9.6	11.5	9.1	11.0	8.8	10.6
64	6400	7300	2.11	2.54	9.7	11.7	9.3	11.2	8.9	10.7
65	6500	7400	2.14	2.58	9.8	11.8	9.4	11.3	9.0	10.9
66	6600	7500	2.17	2.62	10.0	12.0	9.5	11.5	9.1	11.0
67	6700	7700	2.20	2.69	10.1	12.4	9.7	11.8	9.3	11.3
68	6800	7800	2.23	2.73	10.2	12.5	9.8	12.0	9.4	11.5
69	6900	7900	2.26	2.77	10.4	12.7	9.9	12.2	9.5	11.7
70	7000	8000	2.29	2.81	10.5	12.9	10.1	12.3	9.6	11.8
71	7100	8100	2.31	2.84	10.6	13.0	10.1	12.5	9.7	12.0
72	7200	8200	2.34	2.88	10.7	13.2	10.3	12.6	9.8	12.1
73	7300	8300	2.37	2.92	10.9	13.4	10.4	12.8	10.0	12.3
74	7400	8500	2.40	2.99	11.0	13.7	10.5	13.1	10.1	12.6
75	7500	8600	2.43	3.03	11.2	13.9	10.7	13.3	10.2	12.8
76	7600	8700	2.45	3.07	11.2	14.1	10.8	13.5	10.3	12.9
77	7700	8800	2.48	3.11	11.4	14.3	10.9	13.7	10.4	13.1
78	7800	8900	2.51	3.15	11.5	14.5	11.0	13.8	10.6	13.3
79	7900	9000	2.54	3.19	11.7	14.6	11.2	14.0	10.7	13.4

MXZ-8B140VA

Total capacity of indoor unit	Capacity (W)		Power Consumption (kW)		Current(A)/220V		Current(A)/230V		Current(A)/240V	
	Cooling	Heating	Cooling	Heating	Cooling	Heating	Cooling	Heating	Cooling	Heating
80	8000	9100	2.56	3.22	11.8	14.8	11.2	14.1	10.8	13.6
81	8100	9300	2.59	3.30	11.9	15.2	11.4	14.5	10.9	13.9
82	8200	9400	2.62	3.34	12.0	15.3	11.5	14.7	11.0	14.1
83	8300	9500	2.65	3.38	12.2	15.5	11.6	14.8	11.2	14.2
84	8400	9600	2.67	3.42	12.3	15.7	11.7	15.0	11.2	14.4
85	8500	9700	2.70	3.45	12.4	15.8	11.9	15.2	11.4	14.5
86	8600	9800	2.73	3.49	12.5	16.0	12.0	15.3	11.5	14.7
87	8700	9900	2.75	3.53	12.6	16.2	12.1	15.5	11.6	14.9
88	8800	10100	2.78	3.61	12.8	16.6	12.2	15.9	11.7	15.2
89	8900	10200	2.81	3.65	12.9	16.8	12.3	16.0	11.8	15.4
90	9000	10300	2.83	3.69	13.0	16.9	12.4	16.2	11.9	15.5
91	9100	10400	2.86	3.73	13.1	17.1	12.6	16.4	12.0	15.7
92	9200	10500	2.88	3.77	13.2	17.3	12.6	16.6	12.1	15.9
93	9300	10600	2.91	3.81	13.4	17.5	12.8	16.7	12.2	16.0
94	9400	10700	2.94	3.85	13.5	17.7	12.9	16.9	12.4	16.2
95	9500	10900	2.96	3.92	13.6	18.0	13.0	17.2	12.5	16.5
96	9600	11000	2.99	3.96	13.7	18.2	13.1	17.4	12.6	16.7
97	9700	11100	3.01	4.00	13.8	18.4	13.2	17.6	12.7	16.8
98	9800	11200	3.04	4.04	14.0	18.5	13.4	17.7	12.8	17.0
99	9900	11300	3.06	4.08	14.0	18.7	13.4	17.9	12.9	17.2
100	10000	11400	3.09	4.12	14.2	18.9	13.6	18.1	13.0	17.3
101	10100	11500	3.13	4.15	14.4	19.1	13.7	18.2	13.2	17.5
102	10200	11700	3.18	4.22	14.6	19.4	14.0	18.5	13.4	17.8
103	10300	11800	3.23	4.25	14.8	19.5	14.2	18.7	13.6	17.9
104	10400	11900	3.27	4.28	15.0	19.7	14.4	18.8	13.8	18.0
105	10500	12000	3.32	4.32	15.2	19.8	14.6	19.0	14.0	18.2
106	10600	12100	3.37	4.35	15.5	20.0	14.8	19.1	14.2	18.3
107	10700	12200	3.41	4.38	15.7	20.1	15.0	19.2	14.4	18.4
108	10800	12300	3.46	4.41	15.9	20.2	15.2	19.4	14.6	18.6
109	10900	12500	3.51	4.48	16.1	20.6	15.4	19.7	14.8	18.9
110	11000	12600	3.56	4.51	16.3	20.7	15.6	19.8	15.0	19.0
111	11100	12700	3.61	4.54	16.6	20.8	15.9	19.9	15.2	19.1
112	11200	12800	3.66	4.57	16.8	21.0	16.1	20.1	15.4	19.2
113	11300	12900	3.71	4.60	17.0	21.1	16.3	20.2	15.6	19.4
114	11400	13000	3.76	4.63	17.3	21.3	16.5	20.3	15.8	19.5
115	11500	13100	3.81	4.66	17.5	21.4	16.7	20.5	16.0	19.6
116	11600	13300	3.87	4.73	17.8	21.7	17.0	20.8	16.3	19.9
117	11700	13400	3.92	4.76	18.0	21.9	17.2	20.9	16.5	20.0
118	11800	13500	3.97	4.79	18.2	22.0	17.4	21.0	16.7	20.2
119	11900	13600	4.03	4.82	18.5	22.1	17.7	21.2	17.0	20.3
120	12000	13700	4.08	4.85	18.7	22.3	17.9	21.3	17.2	20.4
121	12100	13800	4.14	4.88	19.0	22.4	18.2	21.4	17.4	20.5
122	12200	13900	4.19	4.91	19.2	22.5	18.4	21.6	17.6	20.7
123	12300	14100	4.25	4.98	19.5	22.9	18.7	21.9	17.9	21.0
124	12400	14200	4.30	5.01	19.7	23.0	18.9	22.0	18.1	21.1
125	12500	14300	4.36	5.04	20.0	23.1	19.1	22.1	18.4	21.2
126	12600	14400	4.42	5.07	20.3	23.3	19.4	22.3	18.6	21.3
127	12700	14500	4.48	5.10	20.6	23.4	19.7	22.4	18.9	21.5
128	12800	14600	4.54	5.13	20.8	23.6	19.9	22.5	19.1	21.6
129	12900	14700	4.60	5.16	21.1	23.7	20.2	22.7	19.4	21.7
130	13000	14900	4.66	5.23	21.4	24.0	20.5	23.0	19.6	22.0
131	13100	15000	4.72	5.26	21.7	24.2	20.7	23.1	19.9	22.1
132	13200	15100	4.78	5.29	21.9	24.3	21.0	23.2	20.1	22.3
133	13300	15200	4.84	5.32	22.2	24.4	21.3	23.4	20.4	22.4
134	13400	15300	4.91	5.35	22.5	24.6	21.6	23.5	20.7	22.5
135	13500	15400	4.97	5.38	22.8	24.7	21.8	23.6	20.9	22.6
136	13600	15500	5.01	5.37	23.0	24.7	22.0	23.6	21.1	22.6
137	13700	15700	5.05	5.40	23.2	24.8	22.2	23.7	21.3	22.7
138	13800	15800	5.09	5.40	23.4	24.8	22.4	23.7	21.4	22.7
139	13900	15900	5.14	5.39	23.6	24.7	22.6	23.7	21.6	22.7
140	14000	16000	5.18	5.38	23.8	24.7	22.7	23.6	21.8	22.6
141	14000	16000	5.18	5.34	23.8	24.5	22.7	23.5	21.8	22.5
142	14000	16000	5.19	5.31	23.8	24.4	22.8	23.3	21.8	22.3
143	14000	16000	5.19	5.27	23.8	24.2	22.8	23.1	21.8	22.2
144	14000	16000	5.20	5.23	23.9	24.0	22.8	23.0	21.9	22.0
145	14000	16000	5.20	5.19	23.9	23.8	22.8	22.8	21.9	21.8
146	14000	16000	5.21	5.16	23.9	23.7	22.9	22.7	21.9	21.7
147	14000	16000	5.21	5.12	23.9	23.5	22.9	22.5	21.9	21.5

MXZ-8B140VA

Total capacity of indoor unit	Capacity (W)		Power Consumption (kW)		Current(A)/220V		Current(A)/230V		Current(A)/240V	
	Cooling	Heating	Cooling	Heating	Cooling	Heating	Cooling	Heating	Cooling	Heating
148	14000	16000	5.22	5.09	24.0	23.4	22.9	22.4	22.0	21.4
149	14000	16000	5.22	5.05	24.0	23.2	22.9	22.2	22.0	21.3
150	14000	16000	5.22	5.01	24.0	23.0	22.9	22.0	22.0	21.1
151	14000	16000	5.15	4.96	23.6	22.8	22.6	21.8	21.7	20.9
152	14000	16000	5.08	4.90	23.3	22.5	22.3	21.5	21.4	20.6
153	14000	16000	5.01	4.85	23.0	22.3	22.0	21.3	21.1	20.4
154	14000	16000	4.95	4.80	22.7	22.0	21.7	21.1	20.8	20.2
155	14000	16000	4.89	4.74	22.5	21.8	21.5	20.8	20.6	19.9
156	14000	16000	4.82	4.69	22.1	21.5	21.2	20.6	20.3	19.7
157	14000	16000	4.76	4.64	21.9	21.3	20.9	20.4	20.0	19.5
158	14000	16000	4.71	4.60	21.6	21.1	20.7	20.2	19.8	19.4
159	14000	16000	4.65	4.55	21.3	20.9	20.4	20.0	19.6	19.1
160	14000	16000	4.59	4.50	21.1	20.7	20.2	19.8	19.3	18.9
161	14000	16000	4.54	4.46	20.8	20.5	19.9	19.6	19.1	18.8
162	14000	16000	4.49	4.41	20.6	20.2	19.7	19.4	18.9	18.6
163	14000	16000	4.43	4.37	20.3	20.1	19.5	19.2	18.6	18.4
164	14000	16000	4.38	4.33	20.1	19.9	19.2	19.0	18.4	18.2
165	14000	16000	4.33	4.28	19.9	19.7	19.0	18.8	18.2	18.0
166	14000	16000	4.28	4.24	19.7	19.5	18.8	18.6	18.0	17.8
167	14000	16000	4.24	4.20	19.5	19.3	18.6	18.4	17.8	17.7
168	14000	16000	4.19	4.16	19.2	19.1	18.4	18.3	17.6	17.5
169	14000	16000	4.14	4.12	19.0	18.9	18.2	18.1	17.4	17.3
170	14000	16000	4.10	4.09	18.8	18.8	18.0	18.0	17.3	17.2
171	14000	16000	4.06	4.05	18.6	18.6	17.8	17.8	17.1	17.0
172	14000	16000	4.01	4.01	18.4	18.4	17.6	17.6	16.9	16.9
173	14000	16000	3.97	3.98	18.2	18.3	17.4	17.5	16.7	16.8
174	14000	16000	3.93	3.94	18.0	18.1	17.3	17.3	16.5	16.6
175	14000	16000	3.89	3.91	17.9	18.0	17.1	17.2	16.4	16.5
176	14000	16000	3.86	3.87	17.7	17.8	16.9	17.0	16.2	16.3
177	14000	16000	3.81	3.84	17.5	17.6	16.7	16.9	16.0	16.2
178	14000	16000	3.78	3.80	17.4	17.4	16.6	16.7	15.9	16.0
179	14000	16000	3.74	3.77	17.2	17.3	16.4	16.6	15.7	15.9
180	14000	16000	3.70	3.74	17.0	17.2	16.2	16.4	15.6	15.7
181	14000	16000	3.67	3.71	16.9	17.0	16.1	16.3	15.4	15.6
182	14000	16000	3.63	3.68	16.7	16.9	15.9	16.2	15.3	15.5
183	14000	16000	3.60	3.65	16.5	16.8	15.8	16.0	15.2	15.4
184	14000	16000	3.57	3.62	16.4	16.6	15.7	15.9	15.0	15.2
185	14000	16000	3.53	3.59	16.2	16.5	15.5	15.8	14.9	15.1

MXZ-8B160VA

Before calculating the sum of total capacity of indoor units, please convert the value into the kW model capacity following the formula on "4-1-2. Method of obtaining the heating and cooling capacity of an indoor unit:".

Total capacity of indoor unit	Capacity (W)		Power Consumption (kW)		Current(A)/220V		Current(A)/230V		Current(A)/240V	
	Cooling	Heating	Cooling	Heating	Cooling	Heating	Cooling	Heating	Cooling	Heating
15	1500	1700	0.80	0.58	3.7	2.7	3.5	2.5	3.4	2.4
16	1600	1900	0.84	0.65	3.9	3.0	3.7	2.9	3.5	2.7
17	1700	2000	0.87	0.69	4.0	3.2	3.8	3.0	3.7	2.9
18	1800	2100	0.91	0.72	4.2	3.3	4.0	3.2	3.8	3.0
19	1900	2200	0.95	0.76	4.4	3.5	4.2	3.3	4.0	3.2
20	2000	2300	0.98	0.79	4.5	3.6	4.3	3.5	4.1	3.3
21	2100	2400	1.02	0.82	4.7	3.8	4.5	3.6	4.3	3.5
22	2200	2600	1.05	0.89	4.8	4.1	4.6	3.9	4.4	3.7
23	2300	2700	1.08	0.93	5.0	4.3	4.7	4.1	4.5	3.9
24	2400	2800	1.11	0.96	5.1	4.4	4.9	4.2	4.7	4.0
25	2500	2900	1.14	1.00	5.2	4.6	5.0	4.4	4.8	4.2
26	2600	3000	1.17	1.03	5.4	4.7	5.1	4.5	4.9	4.3
27	2700	3100	1.20	1.06	5.5	4.9	5.3	4.7	5.1	4.5
28	2800	3300	1.23	1.13	5.6	5.2	5.4	5.0	5.2	4.8
29	2900	3400	1.26	1.17	5.8	5.4	5.5	5.1	5.3	4.9
30	3000	3500	1.28	1.20	5.9	5.5	5.6	5.3	5.4	5.1
31	3100	3600	1.31	1.24	6.0	5.7	5.8	5.4	5.5	5.2
32	3200	3700	1.33	1.27	6.1	5.8	5.8	5.6	5.6	5.3
33	3300	3800	1.36	1.31	6.2	6.0	6.0	5.8	5.7	5.5
34	3400	3900	1.38	1.34	6.3	6.2	6.1	5.9	5.8	5.6
35	3500	4100	1.41	1.41	6.5	6.5	6.2	6.2	5.9	5.9
36	3600	4200	1.43	1.44	6.6	6.6	6.3	6.3	6.0	6.1
37	3700	4300	1.45	1.48	6.7	6.8	6.4	6.5	6.1	6.2
38	3800	4400	1.47	1.51	6.7	6.9	6.5	6.6	6.2	6.4
39	3900	4500	1.49	1.55	6.8	7.1	6.5	6.8	6.3	6.5
40	4000	4600	1.51	1.58	6.9	7.3	6.6	6.9	6.4	6.6
41	4100	4800	1.53	1.65	7.0	7.6	6.7	7.2	6.4	6.9
42	4200	4900	1.55	1.68	7.1	7.7	6.8	7.4	6.5	7.1
43	4300	5000	1.57	1.72	7.2	7.9	6.9	7.6	6.6	7.2
44	4400	5100	1.59	1.75	7.3	8.0	7.0	7.7	6.7	7.4
45	4500	5200	1.61	1.79	7.4	8.2	7.1	7.9	6.8	7.5
46	4600	5300	1.63	1.82	7.5	8.4	7.2	8.0	6.9	7.7
47	4700	5500	1.65	1.89	7.6	8.7	7.2	8.3	6.9	8.0
48	4800	5600	1.66	1.92	7.6	8.8	7.3	8.4	7.0	8.1
49	4900	5700	1.68	1.96	7.7	9.0	7.4	8.6	7.1	8.2
50	5000	5800	1.70	1.99	7.8	9.1	7.5	8.7	7.2	8.4
51	5100	5900	1.73	2.03	7.9	9.3	7.6	8.9	7.3	8.5
52	5200	6000	1.76	2.07	8.1	9.5	7.7	9.1	7.4	8.7
53	5300	6200	1.79	2.14	8.2	9.8	7.9	9.4	7.5	9.0
54	5400	6300	1.82	2.17	8.4	10.0	8.0	9.5	7.7	9.1
55	5500	6400	1.85	2.21	8.5	10.1	8.1	9.7	7.8	9.3
56	5600	6500	1.88	2.25	8.6	10.3	8.3	9.9	7.9	9.5
57	5700	6600	1.91	2.28	8.8	10.5	8.4	10.0	8.0	9.6
58	5800	6700	1.94	2.32	8.9	10.7	8.5	10.2	8.2	9.8
59	5900	6900	1.97	2.39	9.0	11.0	8.7	10.5	8.3	10.1
60	6000	7000	2.00	2.43	9.2	11.2	8.8	10.7	8.4	10.2
61	6100	7100	2.03	2.47	9.3	11.3	8.9	10.8	8.5	10.4
62	6200	7200	2.06	2.50	9.5	11.5	9.0	11.0	8.7	10.5
63	6300	7300	2.08	2.54	9.6	11.7	9.1	11.2	8.8	10.7
64	6400	7400	2.11	2.58	9.7	11.8	9.3	11.3	8.9	10.9
65	6500	7500	2.14	2.62	9.8	12.0	9.4	11.5	9.0	11.0
66	6600	7700	2.17	2.69	10.0	12.4	9.5	11.8	9.1	11.3
67	6700	7800	2.20	2.73	10.1	12.5	9.7	12.0	9.3	11.5
68	6800	7900	2.23	2.77	10.2	12.7	9.8	12.2	9.4	11.7
69	6900	8000	2.26	2.80	10.4	12.9	9.9	12.3	9.5	11.8
70	7000	8100	2.29	2.84	10.5	13.0	10.1	12.5	9.6	12.0
71	7100	8200	2.31	2.88	10.6	13.2	10.1	12.6	9.7	12.1
72	7200	8400	2.34	2.95	10.7	13.5	10.3	13.0	9.8	12.4
73	7300	8500	2.37	2.99	10.9	13.7	10.4	13.1	10.0	12.6
74	7400	8600	2.40	3.03	11.0	13.9	10.5	13.3	10.1	12.8
75	7500	8700	2.43	3.07	11.2	14.1	10.7	13.5	10.2	12.9
76	7600	8800	2.45	3.11	11.2	14.3	10.8	13.7	10.3	13.1
77	7700	8900	2.48	3.14	11.4	14.4	10.9	13.8	10.4	13.2
78	7800	9100	2.51	3.22	11.5	14.8	11.0	14.1	10.6	13.6
79	7900	9200	2.54	3.26	11.7	15.0	11.2	14.3	10.7	13.7

MXZ-8B160VA

Total capacity of indoor unit	Capacity (W)		Power Consumption (kW)		Current(A)/220V		Current(A)/230V		Current(A)/240V	
	Cooling	Heating	Cooling	Heating	Cooling	Heating	Cooling	Heating	Cooling	Heating
80	8000	9300	2.56	3.30	11.8	15.2	11.2	14.5	10.8	13.9
81	8100	9400	2.59	3.33	11.9	15.3	11.4	14.6	10.9	14.0
82	8200	9500	2.62	3.37	12.0	15.5	11.5	14.8	11.0	14.2
83	8300	9600	2.65	3.41	12.2	15.7	11.6	15.0	11.2	14.4
84	8400	9800	2.67	3.49	12.3	16.0	11.7	15.3	11.2	14.7
85	8500	9900	2.70	3.53	12.4	16.2	11.9	15.5	11.4	14.9
86	8600	10000	2.73	3.57	12.5	16.4	12.0	15.7	11.5	15.0
87	8700	10100	2.75	3.60	12.6	16.5	12.1	15.8	11.6	15.2
88	8800	10200	2.78	3.64	12.8	16.7	12.2	16.0	11.7	15.3
89	8900	10300	2.81	3.68	12.9	16.9	12.3	16.2	11.8	15.5
90	9000	10500	2.83	3.76	13.0	17.3	12.4	16.5	11.9	15.8
91	9100	10600	2.86	3.80	13.1	17.4	12.6	16.7	12.0	16.0
92	9200	10700	2.88	3.84	13.2	17.6	12.6	16.9	12.1	16.2
93	9300	10800	2.91	3.88	13.4	17.8	12.8	17.0	12.2	16.3
94	9400	10900	2.94	3.92	13.5	18.0	12.9	17.2	12.4	16.5
95	9500	11000	2.96	3.96	13.6	18.2	13.0	17.4	12.5	16.7
96	9600	11100	2.99	4.00	13.7	18.4	13.1	17.6	12.6	16.8
97	9700	11300	3.01	4.08	13.8	18.7	13.2	17.9	12.7	17.2
98	9800	11400	3.04	4.12	14.0	18.9	13.4	18.1	12.8	17.3
99	9900	11500	3.06	4.16	14.0	19.1	13.4	18.3	12.9	17.5
100	10000	11600	3.09	4.19	14.2	19.2	13.6	18.4	13.0	17.6
101	10100	11700	3.13	4.22	14.4	19.4	13.7	18.5	13.2	17.8
102	10200	11800	3.18	4.26	14.6	19.6	14.0	18.7	13.4	17.9
103	10300	12000	3.23	4.32	14.8	19.8	14.2	19.0	13.6	18.2
104	10400	12100	3.27	4.36	15.0	20.0	14.4	19.1	13.8	18.4
105	10500	12200	3.32	4.39	15.2	20.2	14.6	19.3	14.0	18.5
106	10600	12300	3.37	4.42	15.5	20.3	14.8	19.4	14.2	18.6
107	10700	12400	3.41	4.45	15.7	20.4	15.0	19.5	14.4	18.7
108	10800	12500	3.46	4.48	15.9	20.6	15.2	19.7	14.6	18.9
109	10900	12700	3.51	4.55	16.1	20.9	15.4	20.0	14.8	19.1
110	11000	12800	3.56	4.58	16.3	21.0	15.6	20.1	15.0	19.3
111	11100	12900	3.61	4.61	16.6	21.2	15.9	20.2	15.2	19.4
112	11200	13000	3.66	4.64	16.8	21.3	16.1	20.4	15.4	19.5
113	11300	13100	3.71	4.67	17.0	21.4	16.3	20.5	15.6	19.7
114	11400	13200	3.76	4.70	17.3	21.6	16.5	20.6	15.8	19.8
115	11500	13400	3.81	4.77	17.5	21.9	16.7	20.9	16.0	20.1
116	11600	13500	3.87	4.80	17.8	22.0	17.0	21.1	16.3	20.2
117	11700	13600	3.92	4.83	18.0	22.2	17.2	21.2	16.5	20.3
118	11800	13700	3.97	4.86	18.2	22.3	17.4	21.3	16.7	20.5
119	11900	13800	4.03	4.89	18.5	22.5	17.7	21.5	17.0	20.6
120	12000	13900	4.08	4.92	18.7	22.6	17.9	21.6	17.2	20.7
121	12100	14100	4.14	4.99	19.0	22.9	18.2	21.9	17.4	21.0
122	12200	14200	4.19	5.02	19.2	23.0	18.4	22.0	17.6	21.1
123	12300	14300	4.25	5.05	19.5	23.2	18.7	22.2	17.9	21.3
124	12400	14400	4.30	5.08	19.7	23.3	18.9	22.3	18.1	21.4
125	12500	14500	4.36	5.11	20.0	23.5	19.1	22.4	18.4	21.5
126	12600	14600	4.42	5.14	20.3	23.6	19.4	22.6	18.6	21.6
127	12700	14700	4.48	5.17	20.6	23.7	19.7	22.7	18.9	21.8
128	12800	14900	4.54	5.24	20.8	24.1	19.9	23.0	19.1	22.1
129	12900	15000	4.60	5.27	21.1	24.2	20.2	23.1	19.4	22.2
130	13000	15100	4.66	5.30	21.4	24.3	20.5	23.3	19.6	22.3
131	13100	15200	4.72	5.33	21.7	24.5	20.7	23.4	19.9	22.4
132	13200	15300	4.78	5.36	21.9	24.6	21.0	23.5	20.1	22.6
133	13300	15400	4.84	5.39	22.2	24.7	21.3	23.7	20.4	22.7
134	13400	15600	4.91	5.45	22.5	25.0	21.6	23.9	20.7	22.9
135	13500	15700	4.97	5.48	22.8	25.2	21.8	24.1	20.9	23.1
136	13600	15800	5.03	5.51	23.1	25.3	22.1	24.2	21.2	23.2
137	13700	15900	5.10	5.54	23.4	25.4	22.4	24.3	21.5	23.3
138	13800	16000	5.16	5.57	23.7	25.6	22.7	24.5	21.7	23.4
139	13900	16100	5.23	5.60	24.0	25.7	23.0	24.6	22.0	23.6
140	14000	16300	5.33	5.64	24.5	25.9	23.4	24.8	22.4	23.7
141	14100	18000	5.40	6.23	24.8	28.6	23.7	27.4	22.7	26.2
142	14200	18000	5.48	6.22	25.2	28.6	24.1	27.3	23.1	26.2
143	14300	18000	5.55	6.21	25.5	28.5	24.4	27.3	23.4	26.1
144	14400	18000	5.63	6.20	25.8	28.5	24.7	27.2	23.7	26.1
145	14500	18000	5.71	6.19	26.2	28.4	25.1	27.2	24.0	26.1
146	14600	18000	5.79	6.18	26.6	28.4	25.4	27.1	24.4	26.0
147	14700	18000	5.88	6.18	27.0	28.4	25.8	27.1	24.7	26.0

MXZ-8B160VA

Total capacity of indoor unit	Capacity (W)		Power Consumption (kW)		Current(A)/220V		Current(A)/230V		Current(A)/240V	
	Cooling	Heating	Cooling	Heating	Cooling	Heating	Cooling	Heating	Cooling	Heating
148	14800	18000	5.96	6.17	27.4	28.3	26.2	27.1	25.1	26.0
149	14900	18000	6.04	6.16	27.7	28.3	26.5	27.1	25.4	25.9
150	15000	18000	6.15	6.16	28.2	28.3	27.0	27.1	25.9	25.9
151	15100	18000	6.19	6.16	28.4	28.3	27.2	27.1	26.1	25.9
152	15200	18000	6.23	6.16	28.6	28.3	27.4	27.1	26.2	25.9
153	15300	18000	6.27	6.16	28.8	28.3	27.5	27.1	26.4	25.9
154	15400	18000	6.31	6.16	29.0	28.3	27.7	27.1	26.6	25.9
155	15500	18000	6.37	6.17	29.2	28.3	28.0	27.1	26.8	26.0
156	15500	18000	6.32	6.14	29.0	28.2	27.8	27.0	26.6	25.8
157	15500	18000	6.28	6.10	28.8	28.0	27.6	26.8	26.4	25.7
158	15500	18000	6.23	6.06	28.6	27.8	27.4	26.6	26.2	25.5
159	15500	18000	6.18	6.02	28.4	27.6	27.1	26.4	26.0	25.3
160	15500	18000	6.14	5.98	28.2	27.5	27.0	26.3	25.8	25.2
161	15500	18000	6.09	5.94	28.0	27.3	26.7	26.1	25.6	25.0
162	15500	18000	6.05	5.91	27.8	27.1	26.6	26.0	25.5	24.9
163	15500	18000	6.00	5.87	27.5	27.0	26.4	25.8	25.3	24.7
164	15500	18000	5.96	5.83	27.4	26.8	26.2	25.6	25.1	24.5
165	15500	18000	5.91	5.80	27.1	26.6	26.0	25.5	24.9	24.4
166	15500	18000	5.87	5.76	27.0	26.4	25.8	25.3	24.7	24.2
167	15500	18000	5.83	5.73	26.8	26.3	25.6	25.2	24.5	24.1
168	15500	18000	5.79	5.69	26.6	26.1	25.4	25.0	24.4	23.9
169	15500	18000	5.75	5.66	26.4	26.0	25.3	24.9	24.2	23.8
170	15500	18000	5.71	5.63	26.2	25.8	25.1	24.7	24.0	23.7
171	15500	18000	5.67	5.59	26.0	25.7	24.9	24.5	23.9	23.5
172	15500	18000	5.63	5.56	25.8	25.5	24.7	24.4	23.7	23.4
173	15500	18000	5.59	5.53	25.7	25.4	24.5	24.3	23.5	23.3
174	15500	18000	5.55	5.50	25.5	25.3	24.4	24.2	23.4	23.1
175	15500	18000	5.52	5.47	25.3	25.1	24.2	24.0	23.2	23.0
176	15500	18000	5.48	5.43	25.2	24.9	24.1	23.8	23.1	22.9
177	15500	18000	5.44	5.40	25.0	24.8	23.9	23.7	22.9	22.7
178	15500	18000	5.41	5.37	24.8	24.7	23.8	23.6	22.8	22.6
179	15500	18000	5.37	5.34	24.7	24.5	23.6	23.5	22.6	22.5
180	15500	18000	5.34	5.31	24.5	24.4	23.5	23.3	22.5	22.3
181	15500	18000	5.30	5.28	24.3	24.2	23.3	23.2	22.3	22.2
182	15500	18000	5.27	5.26	24.2	24.2	23.1	23.1	22.2	22.1
183	15500	18000	5.23	5.23	24.0	24.0	23.0	23.0	22.0	22.0
184	15500	18000	5.20	5.20	23.9	23.9	22.8	22.8	21.9	21.9
185	15500	18000	5.17	5.17	23.7	23.7	22.7	22.7	21.8	21.8
186	15500	18000	5.14	5.14	23.6	23.6	22.6	22.6	21.6	21.6
187	15500	18000	5.10	5.11	23.4	23.5	22.4	22.4	21.5	21.5
188	15500	18000	5.07	5.09	23.3	23.4	22.3	22.4	21.3	21.4
189	15500	18000	5.04	5.06	23.1	23.2	22.1	22.2	21.2	21.3
190	15500	18000	5.01	5.03	23.0	23.1	22.0	22.1	21.1	21.2
191	15500	18000	4.98	5.01	22.9	23.0	21.9	22.0	21.0	21.1
192	15500	18000	4.95	4.98	22.7	22.9	21.7	21.9	20.8	21.0
193	15500	18000	4.92	4.95	22.6	22.7	21.6	21.7	20.7	20.8
194	15500	18000	4.89	4.93	22.5	22.6	21.5	21.7	20.6	20.7
195	15500	18000	4.86	4.90	22.3	22.5	21.3	21.5	20.5	20.6
196	15500	18000	4.83	4.88	22.2	22.4	21.2	21.4	20.3	20.5
197	15500	18000	4.81	4.85	22.1	22.3	21.1	21.3	20.2	20.4
198	15500	18000	4.78	4.83	21.9	22.2	21.0	21.2	20.1	20.3
199	15500	18000	4.75	4.80	21.8	22.0	20.9	21.1	20.0	20.2
200	15500	18000	4.71	4.77	21.7	21.9	20.7	21.0	19.9	20.1
201	15500	18000	4.70	4.76	21.6	21.9	20.6	20.9	19.8	20.0
202	15500	18000	4.67	4.73	21.4	21.7	20.5	20.8	19.7	19.9

MXZ-8B140YA

Before calculating the sum of total capacity of indoor units, please convert the value into the kW model capacity following the formula on "4-1-2. Method of obtaining the heating and cooling capacity of an indoor unit:".

Total capacity of indoor unit	Capacity (W)		Power Consumption (kW)		Current(A)/380V		Current(A)/400V		Current(A)/415V	
	Cooling	Heating	Cooling	Heating	Cooling	Heating	Cooling	Heating	Cooling	Heating
15	1500	1700	0.80	0.58	1.2	0.9	1.2	0.8	1.1	0.8
16	1600	1800	0.84	0.62	1.3	1.0	1.2	0.9	1.2	0.9
17	1700	1900	0.87	0.65	1.3	1.0	1.3	0.9	1.2	0.9
18	1800	2100	0.91	0.72	1.4	1.1	1.3	1.0	1.3	1.0
19	1900	2200	0.95	0.76	1.5	1.2	1.4	1.1	1.3	1.1
20	2000	2300	0.98	0.79	1.5	1.2	1.4	1.2	1.4	1.1
21	2100	2400	1.02	0.82	1.6	1.3	1.5	1.2	1.4	1.2
22	2200	2500	1.05	0.86	1.6	1.3	1.5	1.3	1.5	1.2
23	2300	2600	1.08	0.89	1.7	1.4	1.6	1.3	1.5	1.3
24	2400	2700	1.11	0.93	1.7	1.4	1.6	1.4	1.6	1.3
25	2500	2900	1.14	1.00	1.7	1.5	1.7	1.5	1.6	1.4
26	2600	3000	1.17	1.03	1.8	1.6	1.7	1.5	1.6	1.4
27	2700	3100	1.20	1.06	1.8	1.6	1.7	1.5	1.7	1.5
28	2800	3200	1.23	1.10	1.9	1.7	1.8	1.6	1.7	1.5
29	2900	3300	1.26	1.13	1.9	1.7	1.8	1.6	1.8	1.6
30	3000	3400	1.28	1.17	2.0	1.8	1.9	1.7	1.8	1.6
31	3100	3500	1.31	1.20	2.0	1.8	1.9	1.7	1.8	1.7
32	3200	3700	1.33	1.27	2.0	1.9	1.9	1.9	1.9	1.8
33	3300	3800	1.36	1.31	2.1	2.0	2.0	1.9	1.9	1.8
34	3400	3900	1.38	1.34	2.1	2.1	2.0	2.0	1.9	1.9
35	3500	4000	1.41	1.37	2.2	2.1	2.1	2.0	2.0	1.9
36	3600	4100	1.43	1.41	2.2	2.2	2.1	2.1	2.0	2.0
37	3700	4200	1.45	1.44	2.2	2.2	2.1	2.1	2.0	2.0
38	3800	4300	1.47	1.48	2.3	2.3	2.1	2.2	2.1	2.1
39	3900	4500	1.49	1.55	2.3	2.4	2.2	2.3	2.1	2.2
40	4000	4600	1.51	1.58	2.3	2.4	2.2	2.3	2.1	2.2
41	4100	4700	1.53	1.61	2.3	2.5	2.2	2.3	2.2	2.3
42	4200	4800	1.55	1.65	2.4	2.5	2.3	2.4	2.2	2.3
43	4300	4900	1.57	1.68	2.4	2.6	2.3	2.4	2.2	2.4
44	4400	5000	1.59	1.72	2.4	2.6	2.3	2.5	2.2	2.4
45	4500	5100	1.61	1.75	2.5	2.7	2.3	2.6	2.3	2.5
46	4600	5300	1.63	1.82	2.5	2.8	2.4	2.7	2.3	2.6
47	4700	5400	1.65	1.86	2.5	2.9	2.4	2.7	2.3	2.6
48	4800	5500	1.66	1.89	2.5	2.9	2.4	2.8	2.3	2.7
49	4900	5600	1.68	1.92	2.6	2.9	2.4	2.8	2.4	2.7
50	5000	5700	1.70	1.96	2.6	3.0	2.5	2.9	2.4	2.8
51	5100	5800	1.73	2.00	2.7	3.1	2.5	2.9	2.4	2.8
52	5200	5900	1.76	2.03	2.7	3.1	2.6	3.0	2.5	2.9
53	5300	6100	1.79	2.10	2.7	3.2	2.6	3.1	2.5	3.0
54	5400	6200	1.82	2.14	2.8	3.3	2.7	3.1	2.6	3.0
55	5500	6300	1.85	2.18	2.8	3.3	2.7	3.2	2.6	3.1
56	5600	6400	1.88	2.21	2.9	3.4	2.7	3.2	2.6	3.1
57	5700	6500	1.91	2.25	2.9	3.5	2.8	3.3	2.7	3.2
58	5800	6600	1.94	2.29	3.0	3.5	2.8	3.3	2.7	3.2
59	5900	6700	1.97	2.32	3.0	3.6	2.9	3.4	2.8	3.3
60	6000	6900	2.00	2.40	3.1	3.7	2.9	3.5	2.8	3.4
61	6100	7000	2.03	2.43	3.1	3.7	3.0	3.5	2.9	3.4
62	6200	7100	2.06	2.47	3.2	3.8	3.0	3.6	2.9	3.5
63	6300	7200	2.08	2.51	3.2	3.9	3.0	3.7	2.9	3.5
64	6400	7300	2.11	2.54	3.2	3.9	3.1	3.7	3.0	3.6
65	6500	7400	2.14	2.58	3.3	4.0	3.1	3.8	3.0	3.6
66	6600	7500	2.17	2.62	3.3	4.0	3.2	3.8	3.0	3.7
67	6700	7700	2.20	2.69	3.4	4.1	3.2	3.9	3.1	3.8
68	6800	7800	2.23	2.73	3.4	4.2	3.3	4.0	3.1	3.8
69	6900	7900	2.26	2.77	3.5	4.3	3.3	4.0	3.2	3.9
70	7000	8000	2.29	2.81	3.5	4.3	3.3	4.1	3.2	3.9
71	7100	8100	2.31	2.84	3.5	4.4	3.4	4.1	3.2	4.0
72	7200	8200	2.34	2.88	3.6	4.4	3.4	4.2	3.3	4.0
73	7300	8300	2.37	2.92	3.6	4.5	3.5	4.3	3.3	4.1
74	7400	8500	2.40	2.99	3.7	4.6	3.5	4.4	3.4	4.2
75	7500	8600	2.43	3.03	3.7	4.7	3.5	4.4	3.4	4.3
76	7600	8700	2.45	3.07	3.8	4.7	3.6	4.5	3.4	4.3
77	7700	8800	2.48	3.11	3.8	4.8	3.6	4.5	3.5	4.4
78	7800	8900	2.51	3.15	3.9	4.8	3.7	4.6	3.5	4.4
79	7900	9000	2.54	3.19	3.9	4.9	3.7	4.7	3.6	4.5

MXZ-8B140YA

Total capacity of indoor unit	Capacity (W)		Power Consumption (kW)		Current(A)/380V		Current(A)/400V		Current(A)/415V	
	Cooling	Heating	Cooling	Heating	Cooling	Heating	Cooling	Heating	Cooling	Heating
80	8000	9100	2.56	3.22	3.9	4.9	3.7	4.7	3.6	4.5
81	8100	9300	2.59	3.30	4.0	5.1	3.8	4.8	3.6	4.6
82	8200	9400	2.62	3.34	4.0	5.1	3.8	4.9	3.7	4.7
83	8300	9500	2.65	3.38	4.1	5.2	3.9	4.9	3.7	4.7
84	8400	9600	2.67	3.42	4.1	5.2	3.9	5.0	3.8	4.8
85	8500	9700	2.70	3.45	4.1	5.3	3.9	5.0	3.8	4.8
86	8600	9800	2.73	3.49	4.2	5.4	4.0	5.1	3.8	4.9
87	8700	9900	2.75	3.53	4.2	5.4	4.0	5.1	3.9	5.0
88	8800	10100	2.78	3.61	4.3	5.5	4.1	5.3	3.9	5.1
89	8900	10200	2.81	3.65	4.3	5.6	4.1	5.3	3.9	5.1
90	9000	10300	2.83	3.69	4.3	5.7	4.1	5.4	4.0	5.2
91	9100	10400	2.86	3.73	4.4	5.7	4.2	5.4	4.0	5.2
92	9200	10500	2.88	3.77	4.4	5.8	4.2	5.5	4.0	5.3
93	9300	10600	2.91	3.81	4.5	5.8	4.2	5.6	4.1	5.4
94	9400	10700	2.94	3.85	4.5	5.9	4.3	5.6	4.1	5.4
95	9500	10900	2.96	3.92	4.5	6.0	4.3	5.7	4.2	5.5
96	9600	11000	2.99	3.96	4.6	6.1	4.4	5.8	4.2	5.6
97	9700	11100	3.01	4.00	4.6	6.1	4.4	5.8	4.2	5.6
98	9800	11200	3.04	4.04	4.7	6.2	4.4	5.9	4.3	5.7
99	9900	11300	3.06	4.08	4.7	6.3	4.5	5.9	4.3	5.7
100	10000	11400	3.09	4.12	4.7	6.3	4.5	6.0	4.3	5.8
101	10100	11500	3.13	4.15	4.8	6.4	4.6	6.1	4.4	5.8
102	10200	11700	3.18	4.22	4.9	6.5	4.6	6.2	4.5	5.9
103	10300	11800	3.23	4.25	5.0	6.5	4.7	6.2	4.5	6.0
104	10400	11900	3.27	4.28	5.0	6.6	4.8	6.2	4.6	6.0
105	10500	12000	3.32	4.32	5.1	6.6	4.8	6.3	4.7	6.1
106	10600	12100	3.37	4.35	5.2	6.7	4.9	6.3	4.7	6.1
107	10700	12200	3.41	4.38	5.2	6.7	5.0	6.4	4.8	6.2
108	10800	12300	3.46	4.41	5.3	6.8	5.0	6.4	4.9	6.2
109	10900	12500	3.51	4.48	5.4	6.9	5.1	6.5	4.9	6.3
110	11000	12600	3.56	4.51	5.5	6.9	5.2	6.6	5.0	6.3
111	11100	12700	3.61	4.54	5.5	7.0	5.3	6.6	5.1	6.4
112	11200	12800	3.66	4.57	5.6	7.0	5.3	6.7	5.1	6.4
113	11300	12900	3.71	4.60	5.7	7.1	5.4	6.7	5.2	6.5
114	11400	13000	3.76	4.63	5.8	7.1	5.5	6.8	5.3	6.5
115	11500	13100	3.81	4.66	5.8	7.2	5.6	6.8	5.4	6.5
116	11600	13300	3.87	4.73	5.9	7.3	5.6	6.9	5.4	6.6
117	11700	13400	3.92	4.76	6.0	7.3	5.7	6.9	5.5	6.7
118	11800	13500	3.97	4.79	6.1	7.4	5.8	7.0	5.6	6.7
119	11900	13600	4.03	4.82	6.2	7.4	5.9	7.0	5.7	6.8
120	12000	13700	4.08	4.85	6.3	7.4	5.9	7.1	5.7	6.8
121	12100	13800	4.14	4.88	6.4	7.5	6.0	7.1	5.8	6.9
122	12200	13900	4.19	4.91	6.4	7.5	6.1	7.2	5.9	6.9
123	12300	14100	4.25	4.98	6.5	7.6	6.2	7.3	6.0	7.0
124	12400	14200	4.30	5.01	6.6	7.7	6.3	7.3	6.0	7.0
125	12500	14300	4.36	5.04	6.7	7.7	6.4	7.3	6.1	7.1
126	12600	14400	4.42	5.07	6.8	7.8	6.4	7.4	6.2	7.1
127	12700	14500	4.48	5.10	6.9	7.8	6.5	7.4	6.3	7.2
128	12800	14600	4.54	5.13	7.0	7.9	6.6	7.5	6.4	7.2
129	12900	14700	4.60	5.16	7.1	7.9	6.7	7.5	6.5	7.3
130	13000	14900	4.66	5.23	7.2	8.0	6.8	7.6	6.5	7.3
131	13100	15000	4.72	5.26	7.2	8.1	6.9	7.7	6.6	7.4
132	13200	15100	4.78	5.29	7.3	8.1	7.0	7.7	6.7	7.4
133	13300	15200	4.84	5.32	7.4	8.2	7.1	7.8	6.8	7.5
134	13400	15300	4.91	5.35	7.5	8.2	7.2	7.8	6.9	7.5
135	13500	15400	4.97	5.38	7.6	8.3	7.2	7.8	7.0	7.6
136	13600	15500	5.01	5.37	7.7	8.2	7.3	7.8	7.0	7.5
137	13700	15700	5.05	5.40	7.8	8.3	7.4	7.9	7.1	7.6
138	13800	15800	5.09	5.40	7.8	8.3	7.4	7.9	7.2	7.6
139	13900	15900	5.14	5.39	7.9	8.3	7.5	7.9	7.2	7.6
140	14000	16000	5.18	5.38	7.9	8.3	7.6	7.8	7.3	7.6
141	14000	16000	5.18	5.34	7.9	8.2	7.6	7.8	7.3	7.5
142	14000	16000	5.19	5.31	8.0	8.1	7.6	7.7	7.3	7.5
143	14000	16000	5.19	5.27	8.0	8.1	7.6	7.7	7.3	7.4
144	14000	16000	5.20	5.23	8.0	8.0	7.6	7.6	7.3	7.3
145	14000	16000	5.20	5.19	8.0	8.0	7.6	7.6	7.3	7.3
146	14000	16000	5.21	5.16	8.0	7.9	7.6	7.5	7.3	7.3
147	14000	16000	5.21	5.12	8.0	7.9	7.6	7.5	7.3	7.2

MXZ-8B140YA

Total capacity of indoor unit	Capacity (W)		Power Consumption (kW)		Current(A)/380V		Current(A)/400V		Current(A)/415V	
	Cooling	Heating	Cooling	Heating	Cooling	Heating	Cooling	Heating	Cooling	Heating
148	14000	16000	5.22	5.09	8.0	7.8	7.6	7.4	7.3	7.2
149	14000	16000	5.22	5.05	8.0	7.8	7.6	7.4	7.3	7.1
150	14000	16000	5.22	5.01	8.0	7.7	7.6	7.3	7.3	7.0
151	14000	16000	5.15	4.96	7.9	7.6	7.5	7.2	7.2	7.0
152	14000	16000	5.08	4.90	7.8	7.5	7.4	7.1	7.1	6.9
153	14000	16000	5.01	4.85	7.7	7.4	7.3	7.1	7.0	6.8
154	14000	16000	4.95	4.80	7.6	7.4	7.2	7.0	7.0	6.7
155	14000	16000	4.89	4.74	7.5	7.3	7.1	6.9	6.9	6.7
156	14000	16000	4.82	4.69	7.4	7.2	7.0	6.8	6.8	6.6
157	14000	16000	4.76	4.64	7.3	7.1	6.9	6.8	6.7	6.5
158	14000	16000	4.71	4.60	7.2	7.1	6.9	6.7	6.6	6.5
159	14000	16000	4.65	4.55	7.1	7.0	6.8	6.6	6.5	6.4
160	14000	16000	4.59	4.50	7.0	6.9	6.7	6.6	6.5	6.3
161	14000	16000	4.54	4.46	7.0	6.8	6.6	6.5	6.4	6.3
162	14000	16000	4.49	4.41	6.9	6.8	6.5	6.4	6.3	6.2
163	14000	16000	4.43	4.37	6.8	6.7	6.5	6.4	6.2	6.1
164	14000	16000	4.38	4.33	6.7	6.6	6.4	6.3	6.2	6.1
165	14000	16000	4.33	4.28	6.6	6.6	6.3	6.2	6.1	6.0
166	14000	16000	4.28	4.24	6.6	6.5	6.2	6.2	6.0	6.0
167	14000	16000	4.24	4.20	6.5	6.4	6.2	6.1	6.0	5.9
168	14000	16000	4.19	4.16	6.4	6.4	6.1	6.1	5.9	5.8
169	14000	16000	4.14	4.12	6.4	6.3	6.0	6.0	5.8	5.8
170	14000	16000	4.10	4.09	6.3	6.3	6.0	6.0	5.8	5.7
171	14000	16000	4.06	4.05	6.2	6.2	5.9	5.9	5.7	5.7
172	14000	16000	4.01	4.01	6.2	6.2	5.8	5.8	5.6	5.6
173	14000	16000	3.97	3.98	6.1	6.1	5.8	5.8	5.6	5.6
174	14000	16000	3.93	3.94	6.0	6.0	5.7	5.7	5.5	5.5
175	14000	16000	3.89	3.91	6.0	6.0	5.7	5.7	5.5	5.5
176	14000	16000	3.86	3.87	5.9	5.9	5.6	5.6	5.4	5.4
177	14000	16000	3.81	3.84	5.8	5.9	5.6	5.6	5.4	5.4
178	14000	16000	3.78	3.80	5.8	5.8	5.5	5.5	5.3	5.3
179	14000	16000	3.74	3.77	5.7	5.8	5.5	5.5	5.3	5.3
180	14000	16000	3.70	3.74	5.7	5.7	5.4	5.5	5.2	5.3
181	14000	16000	3.67	3.71	5.6	5.7	5.4	5.4	5.2	5.2
182	14000	16000	3.63	3.68	5.6	5.6	5.3	5.4	5.1	5.2
183	14000	16000	3.60	3.65	5.5	5.6	5.2	5.3	5.1	5.1
184	14000	16000	3.57	3.62	5.5	5.6	5.2	5.3	5.0	5.1
185	14000	16000	3.53	3.59	5.4	5.5	5.1	5.2	5.0	5.0

MXZ-8B160YA

Before calculating the sum of total capacity of indoor units, please convert the value into the kW model capacity following the formula on "4-1-2. Method of obtaining the heating and cooling capacity of an indoor unit:".

Total capacity of indoor unit	Capacity (W)		Power Consumption (kW)		Current(A)/380V		Current(A)/400V		Current(A)/415V	
	Cooling	Heating	Cooling	Heating	Cooling	Heating	Cooling	Heating	Cooling	Heating
15	1500	1700	0.80	0.58	1.2	0.9	1.2	0.8	1.1	0.8
16	1600	1900	0.84	0.65	1.3	1.0	1.2	0.9	1.2	0.9
17	1700	2000	0.87	0.69	1.3	1.1	1.3	1.0	1.2	1.0
18	1800	2100	0.91	0.72	1.4	1.1	1.3	1.0	1.3	1.0
19	1900	2200	0.95	0.76	1.5	1.2	1.4	1.1	1.3	1.1
20	2000	2300	0.98	0.79	1.5	1.2	1.4	1.2	1.4	1.1
21	2100	2400	1.02	0.82	1.6	1.3	1.5	1.2	1.4	1.2
22	2200	2600	1.05	0.89	1.6	1.4	1.5	1.3	1.5	1.3
23	2300	2700	1.08	0.93	1.7	1.4	1.6	1.4	1.5	1.3
24	2400	2800	1.11	0.96	1.7	1.5	1.6	1.4	1.6	1.3
25	2500	2900	1.14	1.00	1.7	1.5	1.7	1.5	1.6	1.4
26	2600	3000	1.17	1.03	1.8	1.6	1.7	1.5	1.6	1.4
27	2700	3100	1.20	1.06	1.8	1.6	1.7	1.5	1.7	1.5
28	2800	3300	1.23	1.13	1.9	1.7	1.8	1.6	1.7	1.6
29	2900	3400	1.26	1.17	1.9	1.8	1.8	1.7	1.8	1.6
30	3000	3500	1.28	1.20	2.0	1.8	1.9	1.7	1.8	1.7
31	3100	3600	1.31	1.24	2.0	1.9	1.9	1.8	1.8	1.7
32	3200	3700	1.33	1.27	2.0	1.9	1.9	1.9	1.9	1.8
33	3300	3800	1.36	1.31	2.1	2.0	2.0	1.9	1.9	1.8
34	3400	3900	1.38	1.34	2.1	2.1	2.0	2.0	1.9	1.9
35	3500	4100	1.41	1.41	2.2	2.2	2.1	2.1	2.0	2.0
36	3600	4200	1.43	1.44	2.2	2.2	2.1	2.1	2.0	2.0
37	3700	4300	1.45	1.48	2.2	2.3	2.1	2.2	2.0	2.1
38	3800	4400	1.47	1.51	2.3	2.3	2.1	2.2	2.1	2.1
39	3900	4500	1.49	1.55	2.3	2.4	2.2	2.3	2.1	2.2
40	4000	4600	1.51	1.58	2.3	2.4	2.2	2.3	2.1	2.2
41	4100	4800	1.53	1.65	2.3	2.5	2.2	2.4	2.2	2.3
42	4200	4900	1.55	1.68	2.4	2.6	2.3	2.4	2.2	2.4
43	4300	5000	1.57	1.72	2.4	2.6	2.3	2.5	2.2	2.4
44	4400	5100	1.59	1.75	2.4	2.7	2.3	2.6	2.2	2.5
45	4500	5200	1.61	1.79	2.5	2.7	2.3	2.6	2.3	2.5
46	4600	5300	1.63	1.82	2.5	2.8	2.4	2.7	2.3	2.6
47	4700	5500	1.65	1.89	2.5	2.9	2.4	2.8	2.3	2.7
48	4800	5600	1.66	1.92	2.5	2.9	2.4	2.8	2.3	2.7
49	4900	5700	1.68	1.96	2.6	3.0	2.4	2.9	2.4	2.8
50	5000	5800	1.70	1.99	2.6	3.1	2.5	2.9	2.4	2.8
51	5100	5900	1.73	2.03	2.7	3.1	2.5	3.0	2.4	2.9
52	5200	6000	1.76	2.07	2.7	3.2	2.6	3.0	2.5	2.9
53	5300	6200	1.79	2.14	2.7	3.3	2.6	3.1	2.5	3.0
54	5400	6300	1.82	2.17	2.8	3.3	2.7	3.2	2.6	3.0
55	5500	6400	1.85	2.21	2.8	3.4	2.7	3.2	2.6	3.1
56	5600	6500	1.88	2.25	2.9	3.5	2.7	3.3	2.6	3.2
57	5700	6600	1.91	2.28	2.9	3.5	2.8	3.3	2.7	3.2
58	5800	6700	1.94	2.32	3.0	3.6	2.8	3.4	2.7	3.3
59	5900	6900	1.97	2.39	3.0	3.7	2.9	3.5	2.8	3.4
60	6000	7000	2.00	2.43	3.1	3.7	2.9	3.5	2.8	3.4
61	6100	7100	2.03	2.47	3.1	3.8	3.0	3.6	2.9	3.5
62	6200	7200	2.06	2.50	3.2	3.8	3.0	3.6	2.9	3.5
63	6300	7300	2.08	2.54	3.2	3.9	3.0	3.7	2.9	3.6
64	6400	7400	2.11	2.58	3.2	4.0	3.1	3.8	3.0	3.6
65	6500	7500	2.14	2.62	3.3	4.0	3.1	3.8	3.0	3.7
66	6600	7700	2.17	2.69	3.3	4.1	3.2	3.9	3.0	3.8
67	6700	7800	2.20	2.73	3.4	4.2	3.2	4.0	3.1	3.8
68	6800	7900	2.23	2.77	3.4	4.3	3.3	4.0	3.1	3.9
69	6900	8000	2.26	2.80	3.5	4.3	3.3	4.1	3.2	3.9
70	7000	8100	2.29	2.84	3.5	4.4	3.3	4.1	3.2	4.0
71	7100	8200	2.31	2.88	3.5	4.4	3.4	4.2	3.2	4.0
72	7200	8400	2.34	2.95	3.6	4.5	3.4	4.3	3.3	4.1
73	7300	8500	2.37	2.99	3.6	4.6	3.5	4.4	3.3	4.2
74	7400	8600	2.40	3.03	3.7	4.7	3.5	4.4	3.4	4.3
75	7500	8700	2.43	3.07	3.7	4.7	3.5	4.5	3.4	4.3
76	7600	8800	2.45	3.11	3.8	4.8	3.6	4.5	3.4	4.4
77	7700	8900	2.48	3.14	3.8	4.8	3.6	4.6	3.5	4.4
78	7800	9100	2.51	3.22	3.9	4.9	3.7	4.7	3.5	4.5
79	7900	9200	2.54	3.26	3.9	5.0	3.7	4.8	3.6	4.6

MXZ-8B160YA

Total capacity of indoor unit	Capacity (W)		Power Consumption (kW)		Current(A)/380V		Current(A)/400V		Current(A)/415V	
	Cooling	Heating	Cooling	Heating	Cooling	Heating	Cooling	Heating	Cooling	Heating
80	8000	9300	2.56	3.30	3.9	5.1	3.7	4.8	3.6	4.6
81	8100	9400	2.59	3.33	4.0	5.1	3.8	4.9	3.6	4.7
82	8200	9500	2.62	3.37	4.0	5.2	3.8	4.9	3.7	4.7
83	8300	9600	2.65	3.41	4.1	5.2	3.9	5.0	3.7	4.8
84	8400	9800	2.67	3.49	4.1	5.4	3.9	5.1	3.8	4.9
85	8500	9900	2.70	3.53	4.1	5.4	3.9	5.1	3.8	5.0
86	8600	10000	2.73	3.57	4.2	5.5	4.0	5.2	3.8	5.0
87	8700	10100	2.75	3.60	4.2	5.5	4.0	5.2	3.9	5.1
88	8800	10200	2.78	3.64	4.3	5.6	4.1	5.3	3.9	5.1
89	8900	10300	2.81	3.68	4.3	5.6	4.1	5.4	3.9	5.2
90	9000	10500	2.83	3.76	4.3	5.8	4.1	5.5	4.0	5.3
91	9100	10600	2.86	3.80	4.4	5.8	4.2	5.5	4.0	5.3
92	9200	10700	2.88	3.84	4.4	5.9	4.2	5.6	4.0	5.4
93	9300	10800	2.91	3.88	4.5	6.0	4.2	5.7	4.1	5.5
94	9400	10900	2.94	3.92	4.5	6.0	4.3	5.7	4.1	5.5
95	9500	11000	2.96	3.96	4.5	6.1	4.3	5.8	4.2	5.6
96	9600	11100	2.99	4.00	4.6	6.1	4.4	5.8	4.2	5.6
97	9700	11300	3.01	4.08	4.6	6.3	4.4	5.9	4.2	5.7
98	9800	11400	3.04	4.12	4.7	6.3	4.4	6.0	4.3	5.8
99	9900	11500	3.06	4.16	4.7	6.4	4.5	6.1	4.3	5.8
100	10000	11600	3.09	4.19	4.7	6.4	4.5	6.1	4.3	5.9
101	10100	11700	3.13	4.22	4.8	6.5	4.6	6.2	4.4	5.9
102	10200	11800	3.18	4.26	4.9	6.5	4.6	6.2	4.5	6.0
103	10300	12000	3.23	4.32	5.0	6.6	4.7	6.3	4.5	6.1
104	10400	12100	3.27	4.36	5.0	6.7	4.8	6.4	4.6	6.1
105	10500	12200	3.32	4.39	5.1	6.7	4.8	6.4	4.7	6.2
106	10600	12300	3.37	4.42	5.2	6.8	4.9	6.4	4.7	6.2
107	10700	12400	3.41	4.45	5.2	6.8	5.0	6.5	4.8	6.3
108	10800	12500	3.46	4.48	5.3	6.9	5.0	6.5	4.9	6.3
109	10900	12700	3.51	4.55	5.4	7.0	5.1	6.6	4.9	6.4
110	11000	12800	3.56	4.58	5.5	7.0	5.2	6.7	5.0	6.4
111	11100	12900	3.61	4.61	5.5	7.1	5.3	6.7	5.1	6.5
112	11200	13000	3.66	4.64	5.6	7.1	5.3	6.8	5.1	6.5
113	11300	13100	3.71	4.67	5.7	7.2	5.4	6.8	5.2	6.6
114	11400	13200	3.76	4.70	5.8	7.2	5.5	6.9	5.3	6.6
115	11500	13400	3.81	4.77	5.8	7.3	5.6	7.0	5.4	6.7
116	11600	13500	3.87	4.80	5.9	7.4	5.6	7.0	5.4	6.7
117	11700	13600	3.92	4.83	6.0	7.4	5.7	7.0	5.5	6.8
118	11800	13700	3.97	4.86	6.1	7.5	5.8	7.1	5.6	6.8
119	11900	13800	4.03	4.89	6.2	7.5	5.9	7.1	5.7	6.9
120	12000	13900	4.08	4.92	6.3	7.6	5.9	7.2	5.7	6.9
121	12100	14100	4.14	4.99	6.4	7.7	6.0	7.3	5.8	7.0
122	12200	14200	4.19	5.02	6.4	7.7	6.1	7.3	5.9	7.1
123	12300	14300	4.25	5.05	6.5	7.8	6.2	7.4	6.0	7.1
124	12400	14400	4.30	5.08	6.6	7.8	6.3	7.4	6.0	7.1
125	12500	14500	4.36	5.11	6.7	7.8	6.4	7.5	6.1	7.2
126	12600	14600	4.42	5.14	6.8	7.9	6.4	7.5	6.2	7.2
127	12700	14700	4.48	5.17	6.9	7.9	6.5	7.5	6.3	7.3
128	12800	14900	4.54	5.24	7.0	8.0	6.6	7.6	6.4	7.4
129	12900	15000	4.60	5.27	7.1	8.1	6.7	7.7	6.5	7.4
130	13000	15100	4.66	5.30	7.2	8.1	6.8	7.7	6.5	7.4
131	13100	15200	4.72	5.33	7.2	8.2	6.9	7.8	6.6	7.5
132	13200	15300	4.78	5.36	7.3	8.2	7.0	7.8	6.7	7.5
133	13300	15400	4.84	5.39	7.4	8.3	7.1	7.9	6.8	7.6
134	13400	15600	4.91	5.45	7.5	8.4	7.2	7.9	6.9	7.7
135	13500	15700	4.97	5.48	7.6	8.4	7.2	8.0	7.0	7.7
136	13600	15800	5.03	5.51	7.7	8.5	7.3	8.0	7.1	7.7
137	13700	15900	5.10	5.54	7.8	8.5	7.4	8.1	7.2	7.8
138	13800	16000	5.16	5.57	7.9	8.5	7.5	8.1	7.3	7.8
139	13900	16100	5.23	5.60	8.0	8.6	7.6	8.2	7.3	7.9
140	14000	16300	5.33	5.64	8.2	8.7	7.8	8.2	7.5	7.9
141	14100	18000	5.40	6.23	8.3	9.6	7.9	9.1	7.6	8.8
142	14200	18000	5.48	6.22	8.4	9.5	8.0	9.1	7.7	8.7
143	14300	18000	5.55	6.21	8.5	9.5	8.1	9.1	7.8	8.7
144	14400	18000	5.63	6.20	8.6	9.5	8.2	9.0	7.9	8.7
145	14500	18000	5.71	6.19	8.8	9.5	8.3	9.0	8.0	8.7
146	14600	18000	5.79	6.18	8.9	9.5	8.4	9.0	8.1	8.7
147	14700	18000	5.88	6.18	9.0	9.5	8.6	9.0	8.3	8.7

MXZ-8B160YA

Total capacity of indoor unit	Capacity (W)		Power Consumption (kW)		Current(A)/380V		Current(A)/400V		Current(A)/415V	
	Cooling	Heating	Cooling	Heating	Cooling	Heating	Cooling	Heating	Cooling	Heating
148	14800	18000	5.96	6.17	9.1	9.5	8.7	9.0	8.4	8.7
149	14900	18000	6.04	6.16	9.3	9.5	8.8	9.0	8.5	8.7
150	15000	18000	6.15	6.16	9.4	9.5	9.0	9.0	8.6	8.7
151	15100	18000	6.19	6.16	9.5	9.5	9.0	9.0	8.7	8.7
152	15200	18000	6.23	6.16	9.6	9.5	9.1	9.0	8.8	8.7
153	15300	18000	6.27	6.16	9.6	9.5	9.1	9.0	8.8	8.7
154	15400	18000	6.31	6.16	9.7	9.5	9.2	9.0	8.9	8.7
155	15500	18000	6.37	6.17	9.8	9.5	9.3	9.0	9.0	8.7
156	15500	18000	6.32	6.14	9.7	9.4	9.2	9.0	8.9	8.6
157	15500	18000	6.28	6.10	9.6	9.4	9.2	8.9	8.8	8.6
158	15500	18000	6.23	6.06	9.6	9.3	9.1	8.8	8.8	8.5
159	15500	18000	6.18	6.02	9.5	9.2	9.0	8.8	8.7	8.5
160	15500	18000	6.14	5.98	9.4	9.2	9.0	8.7	8.6	8.4
161	15500	18000	6.09	5.94	9.3	9.1	8.9	8.7	8.6	8.3
162	15500	18000	6.05	5.91	9.3	9.1	8.8	8.6	8.5	8.3
163	15500	18000	6.00	5.87	9.2	9.0	8.7	8.6	8.4	8.2
164	15500	18000	5.96	5.83	9.1	8.9	8.7	8.5	8.4	8.2
165	15500	18000	5.91	5.80	9.1	8.9	8.6	8.5	8.3	8.2
166	15500	18000	5.87	5.76	9.0	8.8	8.6	8.4	8.2	8.1
167	15500	18000	5.83	5.73	8.9	8.8	8.5	8.4	8.2	8.1
168	15500	18000	5.79	5.69	8.9	8.7	8.4	8.3	8.1	8.0
169	15500	18000	5.75	5.66	8.8	8.7	8.4	8.3	8.1	8.0
170	15500	18000	5.71	5.63	8.8	8.6	8.3	8.2	8.0	7.9
171	15500	18000	5.67	5.59	8.7	8.6	8.3	8.1	8.0	7.9
172	15500	18000	5.63	5.56	8.6	8.5	8.2	8.1	7.9	7.8
173	15500	18000	5.59	5.53	8.6	8.5	8.1	8.1	7.9	7.8
174	15500	18000	5.55	5.50	8.5	8.4	8.1	8.0	7.8	7.7
175	15500	18000	5.52	5.47	8.5	8.4	8.0	8.0	7.8	7.7
176	15500	18000	5.48	5.43	8.4	8.3	8.0	7.9	7.7	7.6
177	15500	18000	5.44	5.40	8.3	8.3	7.9	7.9	7.6	7.6
178	15500	18000	5.41	5.37	8.3	8.2	7.9	7.8	7.6	7.5
179	15500	18000	5.37	5.34	8.2	8.2	7.8	7.8	7.5	7.5
180	15500	18000	5.34	5.31	8.2	8.1	7.8	7.7	7.5	7.5
181	15500	18000	5.30	5.28	8.1	8.1	7.7	7.7	7.4	7.4
182	15500	18000	5.27	5.26	8.1	8.1	7.7	7.7	7.4	7.4
183	15500	18000	5.23	5.23	8.0	8.0	7.6	7.6	7.3	7.3
184	15500	18000	5.20	5.20	8.0	8.0	7.6	7.6	7.3	7.3
185	15500	18000	5.17	5.17	7.9	7.9	7.5	7.5	7.3	7.3
186	15500	18000	5.14	5.14	7.9	7.9	7.5	7.5	7.2	7.2
187	15500	18000	5.10	5.11	7.8	7.8	7.4	7.5	7.2	7.2
188	15500	18000	5.07	5.09	7.8	7.8	7.4	7.4	7.1	7.2
189	15500	18000	5.04	5.06	7.7	7.8	7.3	7.4	7.1	7.1
190	15500	18000	5.01	5.03	7.7	7.7	7.3	7.3	7.0	7.1
191	15500	18000	4.98	5.01	7.6	7.7	7.3	7.3	7.0	7.0
192	15500	18000	4.95	4.98	7.6	7.6	7.2	7.3	7.0	7.0
193	15500	18000	4.92	4.95	7.6	7.6	7.2	7.2	6.9	7.0
194	15500	18000	4.89	4.93	7.5	7.6	7.1	7.2	6.9	6.9
195	15500	18000	4.86	4.90	7.5	7.5	7.1	7.1	6.8	6.9
196	15500	18000	4.83	4.88	7.4	7.5	7.0	7.1	6.8	6.9
197	15500	18000	4.81	4.85	7.4	7.4	7.0	7.1	6.8	6.8
198	15500	18000	4.78	4.83	7.3	7.4	7.0	7.0	6.7	6.8
199	15500	18000	4.75	4.80	7.3	7.4	6.9	7.0	6.7	6.7
200	15500	18000	4.71	4.77	7.2	7.3	6.9	7.0	6.6	6.7
201	15500	18000	4.70	4.76	7.2	7.3	6.9	6.9	6.6	6.7
202	15500	18000	4.67	4.73	7.2	7.3	6.8	6.9	6.6	6.6